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THE UNIVERSITY CALENDAR

1938–39

First Term

		1938	
Sept.	19	Monday	University entrance examinations begin.
Sept.	26	Monday	Academic year begins. Registration of new students.
Sept.	27	Tuesday	Registration of old students.
Sept.	29	Thurs. 8 a.m.	Instruction begins.
Oct.	20	Thursday	Last day for payment of tuition.
Nov.	2	Wednesday	Registration of winter-course students.
Nov.	23	Wed, 6 p.m.	Instruction ends.
			(*Thanksgiving recess*)
Nov.	28	Monday, 8 a.m.	Instruction resumed.
Dec.	21	Wed. 12.50 p.m.	Instruction ends in regular and winter courses.
			(*Christmas recess*)
Jan	5	Thurs. 8 a.m.	Instruction resumed in regular and winter courses.
		1939	
Jan.	11	Wednesday	Birthday of Ezra Cornell. Founder's Day.
Jan.	30	Monday	Term examinations begin.

Second Term

Feb.	10	Friday	Instruction ends in winter courses.
Feb.	10	Friday	Registration of all students.
Feb.	13	Mon. 8 a.m.	Instruction begins in regular courses.
Feb.	13–18		Farm and Home Week.
Mar.	6	Monday	Last day for payment of second-term tuition.
Apr.	1	Sat. 12.50 p.m.	Instruction ends.
			(*Spring recess*)
Apr.	10	Mon. 8 a.m.	Instruction resumed.
May	—	Saturday	Spring Day (*Recess*).
June	5	Monday	Term examinations begin.
June	19	Monday	Seventy-first Annual Commencement.

NEW YORK STATE COLLEGE OF AGRICULTURE

STAFF OF INSTRUCTION, RESEARCH, AND EXTENSION

Edmund Ezra Day, S.B., A.M., Ph.D., LL.D., President of the University.
Livingston Farrand, A.B., M.D., L.H.D., LL.D., President Emeritus.
Carl Edwin Ladd, Ph.D., Dean of the College of Agriculture and Director of the Experiment Stations.
Cornelius Betten, Ph.D., D.Sc., Director of Resident Instruction and Dean of the University Faculty.
Lloyd R. Simons, B.S., Director of Extension and Professor in Extension Service.
Carl Edward Frederick Guterman, Ph.D., Assistant Director of the Cornell University Agricultural Experiment Station and Professor of Plant Pathology.
Anson Wright Gibson, M.S., Professor in Personnel Administration in charge of Former Student Relations, Vocational Guidance, and Placement.
Cedric Hay Guise, B.S., M.F., Professor in Personnel Administration in charge of Admissions.
Willard Waldo Ellis, A.B., LL.B., Librarian.
George Wilson Parker, Bursar.

Professors

Liberty Hyde Bailey, M.S., LL.D., Litt.D., Ex-Dean, Professor Emeritus, and Director of Hortorium.
William Charles Baker, B.S.A., Professor of Drawing, Emeritus.
George Walter Cavanaugh, B.S., Professor of Agricultural Chemistry, Emeritus.
Glenn Washington Herrick, B.S.A., Professor of Economic Entomology, Emeritus.
Oskar Augustus Johannsen, Ph.D., Professor of Entomology, Emeritus.
Thomas Lyttleton Lyon, Ph.D., Professor of Soil Technology, Emeritus.
James George Needham, Ph.D., Litt.D., D.Sc., Professor of Entomology, Emeritus.
James Edward Rice, B.S.A., Professor of Poultry Husbandry, Emeritus.
Hugh Charles Troy, B.S.A., Professor of Dairy Industry, Emeritus.
Wilford Murry Wilson, M.D., Professor of Meteorology, Emeritus.

Bristow Adams, B.A., Professor in Extension Service, Editor, and Chief of Publications.
Arthur Augustus Allen, Ph.D., Professor of Ornithology and Ornithologist in the Experiment Station.
Walfred Albin Anderson, Ph.D., Professor of Rural Social Organization and Rural Sociologist in the Experiment Station.
Sydney Arthur Asdell, Ph.D., Professor of Animal Physiology and Animal Physiologist in the Experiment Station.
John Hall Barron, B.S.A., Extension Professor of Field Crops.
Mortier Franklin Barrus, Ph.D., Extension Professor of Plant Pathology.*
Cora Ella Binzel, M.A., Professor of Rural Education.
James Adrian Bizzell, Ph.D., Professor of Soil Technology and Soil Technologist in the Experiment Station.
Forest Milo Blodgett, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Maurice Chester Bond, Ph.D., Extension Professor of Marketing.
Harold Eugene Botsford, B.S., Extension Professor of Poultry Husbandry.
James Ernest Boyle, Ph.D., Professor of Rural Economy.
Richard Bradfield, Ph.D., Professor of Soil Technology and Soil Technologist in the Experiment Station.

*On leave first term.

James Chester Bradley, Ph.D., Professor of Entomology and Curator of Invertebrate Zoology and Entomologist and Curator in the Experiment Station.
Stanley J. Brownell, M.A., M.S., Extension Professor of Animal Husbandry.
Herman Jacob Brueckner, Ph.D. Extension Professor of Dairy Industry.
Harry Oliver Buckman, Ph.D., Professor of Soil Technology.†
Walter H. Burkholder, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Arthur Brotherton Burrell, B.Sc. Professor of Plant Pathology and Plant Pathologist in the Experiment Station.*
Frank Pores Bussell, Ph.D., Professor of Plant Breeding.
Julian Edward Butterworth, Ph.D., Professor of Rural Education.
Martin Paul Catherwood, Ph.D., Professor of Business Management and Investigator in Business Management in the Experiment Station.
Charles Chupp, Ph.D., Extension Professor of Plant Pathology.
Joshua Alban Cope, M.F., Extension Professor of Forestry.
Leonard Slater Cottrell, Jr., Ph.D., Professor of Rural Social Organization and Rural Sociologist in the Experiment Station.
William Truman Crandall, M.S., Extension Professor of Animal Husbandry.
Otis Freeman Curtis, Ph.D., Professor of Botany and Plant Physiologist in the Experiment Station.
Ralph Wright Curtis, M.S.A., Professor of Ornamental Horticulture.*
Dorothy Celia DeLany, M.S., Professor in Extension Service and Assistant State Leader of Junior Extension.
Arthur Johnson Eames, Ph.D., Professor of Botany.
Theodore Hildreth Eaton, Ph.D., Professor of Rural Education.
George Charles Embody, Ph.D., Sc.D., Professor of Aquiculture and Aquiculturist in the Experiment Station.
Lynn Arthur Emerson, E.E., Ph.D., Professor of Industrial Education.
Rollins Adams Emerson, D.Sc., LL.D., Professor of Plant Breeding and Geneticist in the Experiment Station.
George Abram Everett, A.B., LL.B., Professor of Extension Teaching.
Frank Latta Fairbanks, M.E., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station.
Emery N. Ferriss, Ph.D., Professor of Rural Education.
Harry Morton Fitzpatrick, Ph.D., Professor of Plant Pathology and Mycologist in the Experiment Station.
Earl Alvah Flansburgh, B.S., Professor in Extension Service and County Agent Leader.
Allan Cameron Fraser, Ph.D., Professor of Plant Breeding and Geneticist in the Experiment Station.
Alpheus Mansfield Goodman, B.S.A., Extension Professor of Agricultural Engineering.
Axel Ferdinand Gustafson, Ph.D., Professor of Soil Technology and Soil Technologist in the Experiment Station.
Edward Sewall Guthrie, Ph.D., Professor of Dairy Industry and Dairy Technologist in the Experiment Station.
Earle Volcart Hardenburg, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Floyd Arthur Harper, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.
Edwin Shepherd Harrison, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
Van Breed Hart, Ph.D., Extension Professor of Farm Management.
Herbert Bertsch Hartwig, Ph.D., Professor of Field Crops.
Arthur John Heinicke, Ph.D., Professor of Pomology and Pomologist in the Experiment Station.
Barbour Lawson Herrington, Ph.D., Professor of Dairy Chemistry and Chemist in the Experiment Station.

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*On leave first term. †On leave second term.

Gustave Frederick Heuser, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
Frank Forrest Hill, Ph.D., Professor of Land Economics and Land Economist in the Experiment Station.*
Robert Byron Hinman, Ph.D., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.*
Albert Hoefer, B.S., Professor in Extension Service and Assistant State Leader of Junior Extension.
Ralph Sheldon Hosmer, B.A.S., M.F., Professor of Forestry.
Frank Bonar Howe, M.S., Professor of Soil Technology and Soil Surveyor in the Experiment Station.*
Frederick Bruce Hutt, Ph.D., Professor of Poultry Husbandry and Animal Genetics and Poultry Husbandman and Animal Geneticist in the Experiment Station.
Burton Aaron Jennings, B.S., Extension Professor of Agricultural Engineering.
Lincoln David Kelsey, B.S., Professor in Extension Service.
Asa Carlton King, B.S.A., Professor of Farm Practice and Farm Superintendence.
James Edward Knott, Ph.D., Research Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Lewis Knudson, Ph.D., Professor of Botany and Plant Physiologist in the Experiment Station.
Paul J. Kruse, Ph.D., Professor of Rural Education.
George Nieman Lauman, B.S.A., Professor of Rural Economy.
Harry Houser Love, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
Clive Maine McCay, Ph.D., Professor of Animal Nutrition and Animal Nutritionist in the Experiment Station.
John Clarence McCurdy, B.S., C.E., Professor of Agricultural Engineering.
Laurence Howland MacDaniels, Ph.D., Professor of Pomology and Pomologist in the Experiment Station.
Guy Franklin MacLeod, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
Louis Melville Massey, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Robert Matheson, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.†
Leonard Amby Maynard, Ph.D., Professor of Animal Nutrition and Animal Nutritionist in the Experiment Station.
Edward Gardner Misner, Ph.D., Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Clyde B. Moore, Ph.D., Professor of Rural Education.†
Richard Alan Mordoff, Ph.D., Professor of Meteorology.
Fred Bishop Morris, B.S., Professor in Extension Service and Assistant County Agent Leader.
Frank Barron Morrison, B.S., Professor of Animal Husbandry and Animal Nutrition and Animal Husbandman and Nutritionist in the Experiment Station.
Walter Conrad Muenscher, Ph.D., Professor of Botany and Weed Specialist in the Experiment Station.*
Clyde Hadley Myers, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
William Irving Myers, Ph.D., Professor of Farm Finance and Agricultural Economist in the Experiment Station.
Leo Chandler Norris, Ph.D., Professor of Poultry Husbandry and Poultry Husbandman in the Experiment Station.
Joseph Oskamp, B.S. in Agr., Extension Professor of Pomology.
Charles Edmund Palm, Ph.D., Professor of Entomology and Entomologist in the Experiment Station.
E. Laurence Palmer, Ph.D., Professor of Rural Education.
George Eric Peabody, M.S., Professor of Extension Teaching.

*On leave first term. †On leave second term.

Frank Ashmore Pearson, Ph.D., Professor of Prices and Statistics and Statistician in the Experiment Station.
Loren Clifford Petry, Ph.D., Professor of Botany.
Everett Franklin Phillips, Ph.D., D.Sc., Professor of Apiculture and Apiculturist in the Experiment Station.
Joseph Pullman Porter, B.S., M.S.A., M.L.D., Acting Professor of Ornamental Horticulture.
Whiton Powell, Ph.D., Professor of Business Management and Investigator in Business Management in the Experiment Station.
Otto Rahn, Ph.D., Professor of Bacteriology and Bacteriologist in the Experiment Station.
George Joseph Raleigh, Ph.D., Extension Professor of Vegetable Crops.
Frank Harrison Randolph, B.A., M.E., Professor of Institutional Engineering.†
Lowell Fitz Randolph, Ph.D., Research Professor of Botany and Cytologist in the Experiment Station.
Marius Peter Rasmussen, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.
Philip Adna Readio, Ph.D., Professor of Economic Entomology and Entomologist in the Experiment Station.
Arthur Bernhard Recknagel, B.A., M.F., Professor of Forest Management and Utilization.
Donald Reddick, Ph.D., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.
Howard Wait Riley, M.E., Professor of Agricultural Engineering and Agricultural Engineer in the Experiment Station.
Byron Burnett Robb, M.S. in Agr., Professor of Agricultural Engineering.
Montgomery Robinson, Litt.B., B.S., Professor in Extension Service.
Louis Michael Roehl, B.S., Professor of Farm Mechanics.
Flora Rose, B.S., M.A., Professor of Home Economics.
Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
Dwight Sanderson, Ph.D., Professor of Rural Social Organization and Rural Sociologist in the Experiment Station.
Elmer Seth Savage, Ph.D., D.Sc., Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.
Gad Parker Scoville, B.S. in Agr., M.A., Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Lester Whyland Sharp, Ph.D., D.Sc., Professor of Botany and Cytologist in the Experiment Station.
Paul Francis Sharp, Ph.D., Professor of Dairy Chemistry and Chemist in the Experiment Station.
James Morgan Sherman, Ph.D., Professor of Dairy Industry and Bacteriologist in the Experiment Station.
Ora Smith, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Leland Spencer, Ph.D., Professor of Marketing and Investigator in Marketing in the Experiment Station.
Clifford Nicks Stark, Ph.D., Professor of Bacteriology and Bacteriologist in the Experiment Station.
Rolland Maclaren Stewart, Ph.D., Professor of Rural Education.
Charles Arthur Taylor, B.S., Professor in Extension Service.
Homer Columbus Thompson, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Ernest Van Alstine, Ph.D., Extension Professor of Soil Technology.*
Philip Henry Wessels, M.S., Research Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Ralph Hicks Wheeler, B.S., Professor in Extension Service and Assistant University Treasurer.
Herbert Hice Whetzel, M.A., D.Sc., Professor of Plant Pathology and Plant Pathologist in the Experiment Station.†

*On leave first term. †On leave second term.

Edward Albert White, B.Sc., Professor of Floriculture and Ornamental Horticulture and Floriculturist in the Experiment Station.
Karl McKay Wiegand, Ph.D., Professor of Botany.
Roy Glenn Wiggans, Ph.D., Professor of Plant Breeding and Plant Breeder in the Experiment Station.
Benjamin Dunbar Wilson, Ph.D., Professor of Soil Technology and Soil Chemist in the Experiment Station.
James Kenneth Wilson, Ph.D., Professor of Soil Technology and Soil Bacteriologist in the Experiment Station.*
Andrew Leon Winsor, Ph.D., Professor of Rural Education.
Paul Work, Ph.D., Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Edmund Louis Worthen, M.S.A., Extension Professor of Soil Technology.
Albert Hazen Wright, Ph.D., Professor of Zoology.
William Joseph Wright, M.S., Professor in Extension Service and State Leader of Junior Extension.

Assistant Professors

Winfred Enos Ayres, Assistant Professor of Dairy Industry.
Erl Bates, M.D., Adviser in Indian Extension.
Thomas Levingston Bayne, jr., Ph.D., Assistant Professor of Rural Education.
William Ernest Blauvelt, Ph.D., Extension Assistant Professor of Economic Entomology.
Damon Boynton, Ph.D., Assistant Professor of Pomology in the Experiment Station.
Clarence Greenfield Bradt, B.S., Extension Assistant Professor of Animal Husbandry.
Jacob Herbert Bruckner, Ph.D , Assistant Professor of Poultry Husbandry and Assistant Poultry Husbandman in the Experiment Station.
Donald John Bushey, B.S., M.L.D., Extension Assistant Professor of Ornamental Horticulture.
George Samuel Butts, B.S., Assistant Professor in Extension Service and Supervisor of Farm Study Courses.
Robert Flint Chandler, jr., Ph.D., Charles Lathrop Pack Assistant Professor of Forest Soils.
Donald Louis Collins, Ph.D., Assistant Professor of Economic Entomology.
Ralph Waldo Cummings, B.S., Assistant Professor of Soil Technology.
Lowell Clem Cunningham, Ph.D., Extension Assistant Professor of Farm Management.
William Marshall Curtiss, Ph.D., Assistant Professor of Marketing and Investigator in Marketing in the Experiment Station.
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Karl Hermann Fernow, Ph.D., Extension Assistant Professor of Plant Pathology.
Vernon Lachoneus Frampton, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
Richard Felix Fricke, B.S., Assistant County Agent Leader.
Clara Louise Garrett, B.S., Assistant Professor of Drawing.
Frank Arling Haasis, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
Goldan Orlando Hall, Ph.D., Assistant Professor of Poultry Husbandry and Assistant Poultry Husbandman in the Experiment Station.
William John Hamilton, jr., Ph.D., Assistant Professor of Zoology and Assistant Zoologist in the Experiment Station.
David Birney Hand, Ph.D., Assistant Professor of Biochemistry and Assistant Chemist in the Experiment Station.

*On leave first term. †On leave second term.

Theodore Roy Hansberry, Ph.D., Assistant Professor of Toxicology and Toxicologist in the Experiment Station.
Glenn Wilbur Hedlund, Ph.D., Extension Assistant Professor of Farm Finance.
Frederick Emil Heinzelman, B.S., Assistant State Leader of Junior Extension.
Earl Martin Hildebrand, Ph.D., Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
Melvin Butler Hoffman, Ph.D., Extension Assistant Professor of Pomology.
Edwin Fraser Hopkins, Ph.D., Assistant Professor of Botany and Assistant Botanist in the Experiment Station.
Edwin Raymond Hoskins, Ph.D., Assistant Professor of Rural Education.
Chester Jermain Hunn, B.S.A., Assistant Professor of Ornamental Horticulture and Ornamental Horticulturist in the Experiment Station.
Lewis Merwin Hurd, Extension Assistant Professor of Poultry Husbandry.
Thomas Norman Hurd, Ph.D., Extension Assistant Professor of Marketing.
Philip Gustav Johnson, Ph.D., Assistant Professor of Rural Education.
Denis Bowes Johnstone-Wallace, M.S., Assistant Professor of Agrostology and Agrostologist in the Experiment Station.
Myron Slade Kendrick, Ph.D., Assistant Professor of Rural Economy.
George Abdallah Knaysi, Ph.D., Assistant Professor of Bacteriology and Assistant Bacteriologist in the Experiment Station.*
Leland Warner Lamb, M.S., Extension Assistant Professor of Animal Husbandry.
Rowland Willis Leiby, Ph.D., Extension Assistant Professor of Entomology.
Emmons William Leland, B.S.A., Experimentalist in Soil Technology and Assistant Field Experimentalist in the Experiment Station.
Josiah Randall Livermore, Ph.D., Research Assistant Professor of Plant Breeding and Assistant Plant Breeder in the Experiment Station.
Wilfred Douglas Mills, Ph.D., Extension Assistant Professor of Plant Pathology.†
Charles McCammon Mottley, Ph.D., Assistant Professor of Limnology and Limnologist in the Experiment Station.
Leo Augustine Muckle, B.S., Assistant County Agent Leader.
Allan Goodrich Newhall, Ph.D., Research Assistant Professor of Plant Pathology and Assistant Plant Pathologist in the Experiment Station.
Roy A. Olney, Ph.D., Assistant Professor of Rural Education.
Kenneth Gardner Parker, Ph.D., Research Assistant Professor of Plant Pathology.
Hans Platenius, Ph.D., Research Assistant Professor of Vegetable Crops and Investigator in Vegetable Crops in the Experiment Station.
Robert Arnold Polson, Ph.D., Extension Assistant Professor of Rural Social Organization.
Kenneth Post, Ph.D., Assistant Professor of Floriculture and Assistant Floriculturist in the Experiment Station.
Arthur John Pratt, Ph.D., Extension Assistant Professor of Vegetable Crops.
Clinton Beaumont Raymond, B.S., Extension Assistant Professor of Vegetable Crops.
George Harold Rea, Extension Assistant Professor of Apiculture.
Juan Estevan Reyna, E.E., M.A., Assistant Professor of Drawing.
Alexis Lawrence Romanoff, Ph.D., Research Assistant Professor of Poultry Husbandry and Assistant Poultry Husbandman in the Experiment Station.
Glenn Wade Salisbury, Ph.D., Assistant Professor of Animal Husbandry and Assistant Animal Husbandman in the Experiment Station.
Charles Inglehart Sayles, B.S., M.E.E., Assistant Professor of Institutional Engineering.
George Henry Serviss, M.S.A., Extension Assistant Professor of Field Crops.
Earl Young Smith, B.S., Extension Assistant Professor of Poultry Husbandry.
William Arthur Smith, Ph.D., Assistant Professor of Rural Education.
Robert Mumford Smock, Ph.D., Assistant Professor of Pomology and Assistant Pomologist in the Experiment Station.
Ernest Vernon Staker, Ph.D., Assistant Professor of Soil Technology and Assistant Soil Technologist in the Experiment Station.

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*On leave first term. †On leave second term.

George Miksch Sutton, Ph.D., Assistant Professor of Ornithology and Curator of Birds.
Kenneth LeRoy Turk, Ph.D., Extension Assistant Professor of Animal Husbandry.
Clesson Nathan Turner, B.S., Extension Assistant Professor of Agricultural Engineering.
Ellis Flower Wallihan, B.S., Research Assistant Professor of Forestry and Silviculturist in the Experiment Station.
Stanley Whitson Warren, Ph.D., Assistant Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Leland Eugene Weaver, B.S., Extension Assistant Professor of Poultry Husbandry.†
Donald Stuart Welch, Ph.D., Assistant Professor of Plant Pathology and Assistant Forest Pathologist in the Experiment Station.
Paul Stuart Williamson, Ph.D., Assistant Professor of Farm Management and Investigator in Farm Management in the Experiment Station.
Harold Anthony Willman, M.S., Extension Assistant Professor of Animal Husbandry.
John Peter Willman, Ph.D., Assistant Professor of Animal Husbandry and Assistant Animal Husbandman in the Experiment Station.
Forrest Blythe Wright, Ph.D., Assistant Professor of Agricultural Engineering.

INSTRUCTORS

Raymond Clayton Allen, B.S., Instructor in Floriculture.
Peter Paul Babiy, Ph.D., Instructor in Entomology and Curator of Invertebrate Zoology.
Ethel Zoe Bailey, A.B., Curator, Bailey Hortorium.
Harlan Parker Banks, A.B., Instructor in Botany.
Howard Francis Bardwell, Experimentalist in Animal Husbandry in the Experiment Station.
Roy Stanley Beck, Ph.D., Extension Instructor in Farm Management.
Leslie Herbert Bemont, B.S., Extension Instructor in Poultry Husbandry.
William George Bodenstein, M.S., Instructor in Entomology.
Ferdinand Hinckley Butt, Ph.D., Instructor in Limnology.
Robert Theodore Clausen, Ph.D., Instructor, Bailey Hortorium.
Randall Knight Cole, M.S., Instructor in Poultry Husbandry and Assistant in Poultry Husbandry in the Experiment Station.
Ethel Lydia Cowles, B.S., Instructor in Rural Education.
William Thomas Craig, Experimentalist in Plant Breeding in the Experiment Station.
George Wesley Crowther, B.S., Extension Instructor in Agricultural Engineering.
Henry Dietrich, Ph.D., Research Instructor in Entomology.
Ernest Dorsey, Ph.D., Instructor in Plant Breeding and Assistant in Plant Breeding in the Experiment Station.
Lewis Eldred, B.A., Instructor in Rural Education and Chairman of the Bureau of Educational Service.
Gordon Huff Ellis, Ph.D., Instructor in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
Leah English, B.S., Analyst in Agronomy and Assistant in Chemical Analysis in the Experiment Station.
Joseph Andrew Evans, B.S., Extension Instructor in Economic Entomology.
Paul Joseph Findlen, Ph.D., Instructor in Marketing (first term); Extension Instructor in Marketing (second term).
Walton Isaac Fisher, Experimentalist in Plant Breeding in the Experiment Station.
William Trowbridge Merrifield Forbes, Ph.D., Research Instructor in Entomology.
Luella Pearl Gardner, Ph.D., Instructor in Rural Education.
Bernard Facklam Goodrich, B.S., Instructor in Extension Teaching.

†On leave second term.

William Theodore Grams, B.S.A., Instructor in Extension Service.
J. Paul Green, B.A., Instructor in Rural Education.
Grace Hall Griswold, Ph.D., Instructor in Entomology and Assistant in Entomology in the Experiment Station.
Irwin Clyde Gunsalus, M.S., Instructor in Bacteriology.
Mabel Agnes Hastie, B.S., Instructor in Rural Education.
John Parker Hertel, Ph.D., Extension Instructor in Farm Management.
Robert Francis Holland, B.S., Instructor in Dairy Industry.
Katherine Patte Hummel, Ph.D., Research Instructor in Animal Husbandry.
Margaret Hutchins, A.M., Instructor in Rural Education.
Wendell Edgar Keepper, M.S.A., Extension Instructor in Marketing.
Peter Paul Kellogg, Ph.D., Instructor in Ornithology.
Theodore William Kerr, jr., B.S., Assistant in Entomology.
Curtis Gilbert Keyes, M.S., Instructor in Ornamental Horticulture.
Grace Caroline Kimball, Ph.D., Instructor in Animal Husbandry.
James Stephen Knapp, B.S., Instructor in Extension Service.
Vladimir Nicitich Krukovsky, Ph.D., Instructor in Dairy Industry.
Welford Forrest Lamoreux, M.S., Instructor in Poultry Husbandry and Assistant in Poultry Husbandry in the Experiment Station.
Richard August Laubengayer, Ph.D., Instructor in Botany and Assistant in Botany in the Experiment Station.*
Gabriel A. Lebedeff, M.S., Experimentalist in Plant Breeding in the Experiment Station.
Charles Gatewood Lincoln, A.B., Research Instructor in Entomology.
John James McAllister, Experimentalist in Plant Breeding.
Charles Thomas Male, jr., B.S., Instructor in Agricultural Engineering.
Albert Miller, M.S., Instructor in Entomology.
John Ivan Miller, Ph.D., Instructor in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
Floyd Reece Nevin, Ph.D., Instructor in Biology.
Charles Franklin Niven, jr., B.S.A., Instructor in Bacteriology.
Robert Carroll Ogle, Extension Instructor in Poultry Husbandry and Superintendent of Egg Laying Tests.
Edward Marshall Palmquist, Ph.D., Instructor in Botany.
Vernon Sennock Lee Pate, A.B., Instructor in Entomology.
Carl Spencer Pearson, B.S., Assistant Soil Surveyor.
William Napoleon Peigelbeck, B.S., Instructor in Floriculture.
Elmer Strobel Phillips, B.S., Instructor in Extension Teaching.
William Mason Phipps, M.S.A., Analyst in Agronomy.
James Dunbar Pond, M.F., Extension Instructor in Forestry.
Alfred M. S. Pridham, Ph.D., Instructor in Floriculture.
Homer Seymour Pringle, B.S., Extension Instructor in Agricultural Engineering.
William Arthur Rawlins, Ph.D., Research Instructor in Entomology.
Charles Howe Reed, B.S., Extension Instructor in Agricultural Engineering.
Robert Sigmund Reich, B.S., Instructor in Ornamental Horticulture.
Cecil D. Schutt, Instructor in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
Wilber Secor, B.S., Assistant Soil Surveyor.
John Irwin Shafer, jr., Ph.D., Instructor in Botany.
Edwin Stanley Shepardson, B.S., Extension Instructor in Agricultural Engineering.
Henry Thomas Skinner, B.S., Propagator in Ornamental Horticulture.
Lucile Grant Smith, B.S., Extension Instructor in Floriculture and Ornamental Horticulture.
William Marton Smith, M.S., Extension Instructor in Rural Social Organization.
Gladys Athena Sperling, M.S., Research Instructor in Animal Nutrition.
Mrs. Pauline Whitson Stark, M.S., Instructor in Bacteriology and Assistant Bacteriologist in the Experiment Station.
William Davenport Swope, M.S., Extension Instructor in Plant Breeding.

*On leave first term.

George Walter Tailby, B.S.A., Extension Instructor in Animal Husbandry.
James Anbrogio de Tomasi, D.Agr. Sc., Instructor in Microtechnique.
Thomas Broadhead Tracy, M.E., Instructor in Institutional Engineering.
Allan Hosie Treman, A.B., LL.B., Lecturer in Business Law (first term).
Howard Strying Tyler, B.S., Instructor in Land Economics and Assistant Land Economist in the Experiment Station.
Leon John Tyler, Ph.D., Research Instructor in Plant Pathology.
Alfred Van Wagenen, Ph.D., Instructor in Marketing and Investigator in Marketing in the Experiment Station.
Kenneth Eugene Wheeler, B.S., Instructor in Floriculture.
William Lawrence White, B.S., Instructor in Plant Pathology.
Hugh Jeremiah Williams, M.A., Extension Instructor in Rural Social Organization.
Robert Haworth Williams, B.S., Instructor in Botany.

Assistants

Mrs. Mabel White Allen, B.A., Assistant in Botany.
Richard Thomas Allman, B.S.A., Assistant in Agronomy.
Elias Milton Andersen, B.S., Research Assistant in Vegetable Crops.
Carrolle Elizabeth Anderson, M.S., Assistant in Botany.
Flood Shields Andrews, M.S., Assistant in Vegetable Crops.
Willis Harrison Ashton, Assistant in Agricultural Engineering.
MacLean John Babcock, B.S., Assistant in Animal Nutrition.
Lelah Ball, B.A., Assistant in Poultry Husbandry.
William James Barnum, Assistant in Extension Teaching.
Jacob Christopher Bauernfeind, B.S., Assistant in Poultry Husbandry.
Clare August Becker, B.S., Extension Assistant in Farm Management.
Lawrence Stephen Bee, A.B., Assistant in Rural Social Organization.
Kenneth Robert Bennett, B.S., Assistant in Prices and Statistics.
Leon Bernstein, B.S., Assistant in Botany.
Charles Jessie Blanford, B.S., Assistant in Marketing.
Charles Arthur Bratton, B.S., Extension Assistant in Marketing.
John Grobe Brereton, Assistant in Dairy Industry.
James Stanley Brooks, A.B., Assistant in Botany.
Elmer Evans Brown, A.B., Assistant in Biology.
Stewart Henry Burnham, B.S., Assistant Curator in Botany.
Gordon Mann Cairns, B.S., Assistant in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
Edwin Wood Cake, B.S., Assistant in Marketing.
Robert Lyle Carolus, M.S., Research Assistant in Vegetable Crops.
Olaf Guido Cavetz, Assistant in Agronomy.
Webster Allen Chandler, B.S., Assistant in Plant Pathology.
Robert Birney Child, B.S., Assistant in Agronomy.
Daniel Grover Clark, Ph.D., Assistant in Botany.
Marlin George Cline, B.S., Assistant in Agronomy.
Frederic Aurelius Coffey, M.A., Assistant in Rural Economy.
William LaMar Coggshall, B.S., Assistant in Apiculture.
William Earle Colwell, M.S., Assistant in Forest Soils.
Edward Karl Cowan, A.B., Research Assistant in Plant Pathology.
Leland Gwaltney Cox, B.S., Assistant in Forestry.
Metellus Eugene Cravens, jr., M.S.A., Assistant in Marketing.
Otis Freeman Curtis, jr., A.B., Assistant in Botany.
Glenn Elmore Davis, B.Ed., Assistant in Vegetable Crops.
Curtis Howard Dearborn, B.S., Research Assistant in Vegetable Crops.
Phares Decker, M.S., Research Assistant in Plant Pathology.
Herrell Franklin DeGraff, B.S., Assistant in Farm Management.
Roy Luther Donahue, B.S., Assistant in Forestry.
Hugo Doob, jr., Ph.D., Assistant in Dairy Industry.
Ernest Mapp Dunton, jr., M.S., Assistant in Agronomy.
Irvine Elliott, B.S., Assistant in Animal Physiology and Assistant in Animal Physiology in the Experiment Station.

Jacob Douglas Ensminger, M.A., Assistant in Rural Social Organization.
William Monroe Epps, B.S., Research Assistant in Plant Pathology.
Otto Erickson, Assistant in Entomology.
William Howard Ewart, M.Sc., Research Assistant in Entomology.
Donald Brice Ferguson, B.S., Extension Assistant in Marketing.
Hugh Fenner Fitzpatrick, A.B., Assistant in Plant Pathology.
Karl Edrich Gardner, B.S., Assistant in Animal Husbandry and Assistant in Animal Husbandry in the Experiment Station.
Amy Agnes Gessner, M.A., Assistant in Rural Social Organization.
Eva Lucretia Gordon, M.S., Assistant in Rural Education.
Leon Franklin Graves, B.S., Assistant in Meteorology.
Albert Enoch Griffiths, M.S., Assistant in Vegetable Crops.
Arno John Hangas, B.S.A., Assistant in Farm Management.
Earl Dahl Hansing, M.S., Research Assistant in Plant Pathology.
Charles Paul Hegarty, B.S., Assistant in Bacteriology.
Albert Herman Harrington, B.S., Assistant in Land Economics.
Ralph Martin Heinicke, B.S., Research Assistant in Plant Pathology.
Philip Alden Henderson, B.S.A., Assistant in Farm Management.
Wendell Allen Hinkey, A.B., Assistant in Botany.
Adrian Zachariah Hodson, Ph.D., Investigator in Poultry Nutrition.
Joseph Corwin Howell, B.A., Assistant in Biology.
Herbert Sumner Hurlbut, M.S., Assistant in Parasitology.
Ernest Paul Imle, M.Sc., Research Assistant in Plant Pathology.
Walter Casper Jacob, M.S., Research Assistant in Vegetable Crops.
Vernon Cornielian Jamieson, B.S., Assistant in Agronomy.
Karl Hamilton Jarvis, B.S., Assistant in Plant Breeding.
Gordon Alexander Johnsgard, B.S., Research Assistant in Agronomy and Assistant in Soil Chemistry in the Experiment Station.
Francis Elliott Johnstone, jr., M.S., Assistant in Plant Breeding.
Donald Herbery Jolly, A.B., Assistant in Botany.
Alexander Joss, B.S., Assistant in Land Economics.
Oren Lloyd Justice, B.S., Assistant in Botany.
John Ethelbert King, M.S., in Ed., Assistant in Rural Education.
Rhondda King, Assistant in Prices and Statistics.
Herbert Richard Kling, B.S., Assistant in Business Management.
Barney Korchin, B.S., Assistant in Rural Education.
Lela Margaret Koster, M.S., Assistant in Botany.
Carl Lamanna, M.S., Assistant in Bacteriology.
Olin Lafayette Lepard, B.S., Assistant in Animal Husbandry.
Karla Longrée, Ph.D., Assistant in Plant Pathology.
Oscar Anthony Lorenz, B.S., Research Assistant in Vegetable Crops.
Wreal Lesler Lott, A.B., Assistant in Agronomy.
Arnaud Joseph Loustalot, M.S., Assistant in Pomology.
Harold Martin Lucas, B.S., Assistant in Agricultural Engineering.
Edward Albert Lutz, B.S., Assistant in Rural Economy.
Clarence W. Lyon, jr., Assistant in Aquiculture.
Earl Noel McCubbin, A.M., Research Assistant in Vegetable Crops.
John Archibald Mack, B.S., Assistant in Agriculture Education.
Gabriel Raphael Mandels, B.S., Assistant in Botany.
Clyde Augustus Marion, Assistant in Agronomy.
Edwin Harold Matzen, M.S.A., Assistant in Marketing.
Henry Menusan, jr., Ph.D., Research Assistant in Entomology.
Woodrow Wilson Middlekauff, M.S., Assistant in Entomology.
Wilford Richard Mills, B.S., Assistant in Plant Pathology.
Gerald Oakley Mott, B.S., Assistant in Agronomy.
Ray Aaron Murray, B.Sc., Assistant in Rural Education.
Kenneth Bonney Nash, B.S., Research Assistant in Entomology.
Lee Blanton Nash, B.S.A., Research Assistant in Vegetable Crops.
Walter Nelson, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
Jonathan Oscar Nottingham, M.A., Research Assistant in Entomology.

John Scott Page, A.B., Assistant in Rural Social Organization.
Elmer Arthur Palmatier, M.S., Assistant in Botany.
LaVerne LeRoy Pechuman, M.S., Assistant in Entomology.
Edward Stanley Penczek, B.S., Assistant in Dairy Industry.
Arthur William Peterson, B.Sc., Assistant in Farm Management.
Lester Cole Peterson, B.S., Research Assistant in Plant Pathology.
Milo James Peterson, M.S.A., Assistant in Agriculture Education.
Ruth Alice Petry, A.B., Assistant in Botany.
Lincoln Coles Pettit, A.M., Assistant in Biology.
Paul Louis Poiret, B.S., Extension Assistant in Farm Management.
Seth Alison Pope, A.B., Research Assistant in Plant Pathology.
Julius Henry Rainwater, jr., A.B., Assistant in Zoology.
Mrs. Fannie Rane Randolph, M.A., Assistant in Botany.
Edward Cowden Raney, M.S., Assistant in Zoology.
Russel Asoph Rasmussen, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
Hedley John Rayner, M.S., Assistant in Aquiculture.
Ruth Elizabeth Remsberg, M.S., Assistant in Plant Pathology.
Ruby Rema Rice, M.S., Assistant in Plant Pathology.
Frank Joseph Rudert, A.B., Assistant in Dairy Industry.
Sargent Russell, B.Sc., Assistant in Marketing.
Earl Frederick Savage, B.S., Assistant in Pomology.
Albert Horton Sayer, B.S., Assistant in Agricultural Engineering.
D. Clarence Schmutz, M.A., Assistant in Rural Economy.
John Charles Scholes, B.S.A., Assistant in Poultry Husbandry.
William Arvid Seleen, B.S., Assistant in Bacteriology.
Tung Shen, B.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
Henry Lybran Sisk, M.A., Assistant in Rural Education.
Joseph Bjorn Skaptason, M.Sc., Research Assistant in Plant Pathology.
George Herbert Smith, B.Arch., Assistant in Agronomy.
Sedgwick Eugene Smith, B.S., Assistant in Animal Physiology in the Experiment Station.
Thomas Sproston, jr., B.S., Assistant in Plant Pathology.
Finley Moore Steele, B.S., Assistant in Dairy Industry.
Paul David Sturkie, M.S., Research Assistant in Poultry Husbandry.
Clayton Isaac Swayze, A.B., Assistant in Botany.
Robert Dean Sweet, B.S., Research Assistant in Vegetable Crops.
Allen Richard Trotter, B.S., Assistant in Vegetable Crops.
Charles Sterling Tuthill, B.S., Research Assistant in Plant Pathology.
Archie Van Doren, Assistant in Pomology.
Aaron LeRoy Voris, M.S., Assistant in Animal Nutrition and Assistant in Animal Nutrition in the Experiment Station.
Gladys Mildred Wafler, B.S., Assistant in Home Economics Education.
Thomas Cobb Watkins, M.S., Research Assistant in Plant Pathology.
Ross Derrick Watson, M.S., Assistant in Plant Pathology.
Arville S. Wheeler, A.M., Research Assistant in Rural Education (first term).
Orville Henry White, M.S., Assistant in Rural Government.
Robert Henry White-Stevens, B.S., Research Assistant in Vegetable Crops.
Charles Edward Williamson, A.B., Assistant in Plant Pathology.
Warren Charles Wilson, Assistant in Floriculture.
Martin Dwight Woodin, M.S., Assistant in Land Economics.
William Dickey Wylie, B.S.A., Assistant in Entomology.
Charles Porter Zorsch, B.S., Assistant in Entomology.

THE COURSES AVAILABLE

The resident instruction in the College of Agriculture is planned for those who desire training in agriculture and in the sciences most closely related to agriculture. From 70 to 80 per cent of the men graduates of the College go into agricultural pursuits. Besides farming, which is the most common occupation followed, there is a great range of related professional or technical vocations, for which the course in this College offers training. Manufacturing dairy products, teaching agriculture, agricultural extension, work in agricultural experiment stations, and administrative work in farmers' organizations dealing in agricultural products and machinery, may be cited as examples of these vocations.

The instruction is organized, for the most part, in a course of four years, or eight terms, leading to the degree of bachelor of science.

For those who cannot plan to take four years of college work, special curricula are organized, running through one or two years and giving specific training for definite vocational objectives.

Aside from the above, there are a twelve-weeks winter course not giving credit toward a degree and a six-weeks summer school designed especially for teachers, school principals, and superintendents. There are also one-week and two-weeks courses with very specific purposes. Correspondence courses, without credit toward a degree, are available.

The information contained in this announcement applies specifically to the four-year course. Circulars describing the other courses referred to may be obtained on application to the Secretary of the College.

DIRECTIONS REGARDING CORRESPONDENCE

For admission to the freshman class, to the two-year courses, and to advanced standing from other colleges and universities, all communications should be addressed to the Director of Admissions of the University. Other details, as to subjects and methods of admission, are given in the *General Information Number*, which may be obtained on application to the Secretary of the University.

For admission as a special student, communications should be addressed to the Secretary of the College of Agriculture.

For enrollment in correspondence courses, communications may be addressed to the Supervisor of Study Courses in the College of Agriculture.

For admission to graduate work in agriculture and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

ADMISSION AND GRADUATION

The Application for Admission

Admission to the College is not simply a matter of presenting certain specified entrance units. For both the applicant and the

College it is of the utmost concern that a proper choice of college work be made and the College therefore, in making its choice of students to be admitted, considers not only the school record submitted but also any other available indications of probable success in the course the student proposes to take. For this reason the applicant should give, in addition to his formal school credentials, the fullest information regarding his background and experience, the quality of his work, his resources for carrying on, and his own purposes in seeking a college education, so that the College may have a better basis for consultation and decision. Correspondence regarding these matters is solicited and, if it is at all possible, applicants should come to the College for an interview.

Candidates for admission to the four-year course must be at least sixteen years of age. They must have certificates of good moral character; and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting acceptable credentials of the University of the State of New York, or on acceptable school certificates.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering College. This experience is necessary in order to meet the farm-practice requirement (pages 18 and 48).

Every candidate for admission to an undergraduate course must deposit $25 with the University. Candidates are warned not to send cash through the mails. A check, draft, or money order should be made payable to Cornell University and should be sent to the Office of Admissions, Cornell University. The deposit must be made not later than August 1 if the candidate is to be admitted in September and not later than January 1 if he is to be admitted in February.

If the candidate matriculates, the deposit will be credited to his account, $10 for the matriculation fee, $1 for an examination-book fee, and $14 as a guaranty fund, which every undergraduate student is required to maintain and which is to be refunded upon his graduation or permanent withdrawal, less any indebtedness to the University.

If admission is denied a candidate, the deposit is refunded in full at any time.

A candidate may withdraw the application for admission, but a charge of $10 is regularly made for accrued expenses unless the application is withdrawn and a refund of the deposit in full is claimed before August 1. If an application is not withdrawn until after August 1, but is withdrawn before August 31, the $10 charged for accrued expenses is deducted and $15 of the deposit is refunded. No refund is made to an applicant who withdraws the application after August 31.

In the case of applications for admission in February, a withdrawal after January 1 incurs the regular charge of $10, and no refund is made for withdrawal after January 31.

Every candidate for matriculation must submit to the Director of Admissions a satisfactory certificate of vaccination against smallpox, not later than August 1 if he is to be admitted in September, or

not later than January 1 if he is to be admitted in February. It will be accepted as satisfactory only if it certifies that within the last five years a successful vaccination has been performed or three unsuccessful attempts at vaccination have been made.

Candidates for admission must file their credentials and obtain permits for any necessary entrance examinations at the office of the Director of Admissions, Morrill Hall. The results of entrance examinations may be ascertained from the Office of Admissions.

Entrance Requirements for the Four-Year Course

The subjects that may be offered for admission to the College of Agriculture are named in the following list; the figure in parenthesis following each subject indicates its value in entrance units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1.	English, 4 years	(3)	
2.	1st to 3rd Year Greek	(1, 2, 3)	
3.	1st to 4th Year Latin	(1, 2, 3, 4)	
4.	1st to 4th Year German	(1, 2, 3, 4)	
5.	1st to 4th Year French	(1, 2, 3, 4)	
6.	1st to 4th Year Spanish	(1, 2, 3, 4)	
7.	1st to 3d Year Italian	(1, 2, 3)	
8a.	Ancient History	(½–1)	
8b.	European History	(½–1)	
8c.	English History	(½–1)	
8d.	Am. History and Civics	(½–1)	
9a.	Elementary Algebra	(1)	
9b.	Intermediate Algebra	(1)	
9c.	Advanced Algebra	(½)	
9d.	Plane Geometry	(1)	
9e.	Solid Geometry	(½)	
9f.	Plane Trigonometry	(½)	
10.	Physics	(1)	
11.	Chemistry	(1)	
12.	Physical Geography	(½–1)	
13.	Biology*	(1)	
13a.	General Science	(1)	
14.	Botany*	(½–1)	
14a.	Zoology*	(½–1)	
15.	Bookkeeping†	(½–1)	
16.	Agriculture, Home Econ.†	(½–4)	
17.	Drawing	(½–1)	
18.	Manual Training	(½–1)	
19.	Any high-school subject or subjects not already used and acceptable to the University.	(½–2)	

*If an applicant has counted Biology (1), he may not also offer Botany (½) or Zoology (½).

†An applicant may offer not to exceed four units in vocational subjects under numbers 16, 18, and 19, combined. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

For admission to the New York State College of Agriculture, an applicant must offer either A or B, as follows:

A. Fifteen units, arranged as follows: English (3), history (1), elementary algebra (1), plane geometry (1), foreign language (3 units in one language or 2 units in each of two), elective (6 or 5).

B. The New York State Academic Diploma in Agriculture, with the proviso that elementary algebra, 1 unit, and plane geometry, 1 unit, are included. While the diploma, with the proviso indicated, gives full entrance, a student entering upon it and therefore not presenting a foreign language, will be held to include in the elective courses he takes toward his degree, an amount of work corresponding to his shortage in foreign language in one or more of the following subjects: foreign language, English, mathematics, philosophy, psychology, history, economics, political and social science.

Admission with Advanced Standing

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of bachelor of science, he must have completed the prescribed subjects in the four-year course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for his last two terms and have completed no less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

Credit toward a degree for work done in a preparatory school on subjects that may be offered for entrance to the University will be given to those students only who, in addition to satisfying all entrance requirements, pass separate examinations in the subjects for which they seek college credit. These examinations will cover substantially the same ground as the university courses in the subjects. An applicant desiring a college-credit examination of this kind must apply to the Office of Admissions as early as possible, and at least twenty-four hours before the first examination, specifying which fifteen units he intends to offer in satisfaction of the entrance requirements, and on what other entrance subjects he wishes to be examined for credit. In case he fails to satisfy the entrance requirements in any one or more of the units on which he proposes to enter, but passes the credit examination in any other subject or subjects, he may use the latter toward satisfying entrance requirements, but in that case he cannot also receive college credit for it. The college-credit examinations will be held September 19 to 23, 1938, on the dates set for the entrance examinations in the same subjects.

A student who receives at entrance twelve or more hours of credit in addition to the requirements for admission may be regarded as having satisfied one term of residence. Under no circumstances is surplus entrance credit based on extra work done in a preparatory school accepted as the equivalent of more than one term.

A student who has satisfied the entrance requirements of this College, and has afterwards completed in two or more summer sessions in Cornell University at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions is not accepted as the equivalent of more than two terms of residence. The maximum amount of credit toward the degree of bachelor of science which is allowed for the work of any one summer session is eight hours.

Requirements for Admission of Special Students

Opportunity is provided for the admission of students whose needs may not be well met by the organized curricula of the College. Applicants for admission to such special standing must present entrance credentials as other students do and in addition they must present a detailed statement of the program they desire to follow. They must show that they have had recent farm experience or other experience qualifying them for the special work they plan to do and, unless they offer regular entrance, they must be twenty-one years of age.

Students having a first degree and desiring further undergraduate work may be admitted as special students. The work of such students will ordinarily be limited to courses in the College of Agriculture; for work taken outside tuition will be charged at the rate prevailing in the college where the work is done.

Requirements for the Degree of Bachelor of Science

The requirements for the degree of bachelor of science are residence for eight terms, and, in addition to the prescribed work in the Departments of Physical Training and Military Science and Tactics, the completion of one hundred and twenty-two hours of required and elective work, as outlined on pages 18 and 19.

All men students must satisfy the farm-practice requirement before the beginning of the senior year. This requirement is the equivalent of a year or more of actual farm work. In order to meet it, students should have a good working knowledge of horses, cattle, sheep, swine, poultry, crops, and machinery, and of the ordinary farm operations as they are practiced on a general farm. Students should complete the requirement as early in their course as possible, since it is prerequisite for admission to certain courses. Exemption from this requirement is allowed only to students specializing in the Departments of Botany, Bacteriology, or Entomology. Application for such exemption must be made at the office of the Secretary of the College not later than the close of the sophomore year.

Freshmen are required to attend, during their first term, a course designed to orient students in the life of the University and specifically to acquaint them with the scope and purpose of the courses of instruction in the College. The course requires attendance two hours a week and carries one hour of credit.

The Courses Leading to the Degree of Bachelor of Science

(Those required courses which are given in other colleges than Agriculture are described on pages 70 to 73.)

Freshman Orientation Course	1
English	6
Botany, Biology, or Zoology	6
Chemistry or Physics	6

Physiology, one of the following	3
Physiology of Domestic Animals	
Human Physiology	
Plant Physiology	
Economics 1 or 2	5 or 6
Hygiene 1 and 2	2
Science group	18
Botany, Zoology, Bacteriology, Chemistry, Physics, Geology, Physical Geography, Mathematics, Mechanical Drawing, Biology, Psychology, Accounting, Statistics, Sociology	
Agriculture (including any courses listed in this announcement on pages 25–70)	55
Elective (either in Agriculture or in any other college in the University)	20
Total	122

If students who have met the above requirements desire to take courses outside of the College of Agriculture in addition to those required or allowed free in the foregoing list, they may do so upon paying for the additional hours at the rate of tuition prevailing in the colleges where the courses are taken. Failures in courses, either required or elective, taken outside the College of Agriculture are counted against the twenty hours allowed free.

To be eligible for the degree, the student must maintain an average grade of at least 70 for the work of the entire course.

REGISTRATION FOR COURSES

The schedule for the freshman year must include:

Freshman Orientation Course	1
Elective courses in the College of Agriculture	6
Hygiene 1 and 2	2
English 1	6
Botany 1, Biology 1, or Zoology 1	6
Chemistry 102 or 104, Physics 3 and 4	6
Science-group courses or required course in Physiology	3

In selecting his course, the student must obtain the approval of a faculty adviser, preferably in the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year.

A student must register for at least twelve hours each term, and no new student may register for more than eighteen hours.

With few exceptions, class assignments must be obtained from the departments concerned before the registration card can be accepted at the Office of the Director of Resident Instruction. Representatives of departments in the College of Agriculture and of some other

departments, delegated to make these assignments, will be available at the place of registration.

Students who do not present chemistry for entrance are required to take chemistry.

Students who do not present physics for entrance are required to take physics.

Students who do not present geology or physical geography for entrance are required to take one of these subjects.

Necessary changes of registration must be made within the first ten days of a term.

PAYMENTS TO THE UNIVERSITY

Tuition

Tuition is free to undergraduate students pursuing full, special, or short courses in the New York State College of Agriculture, who at the beginning of the college year are, and for at least twelve months prior thereto have been, bona fide residents of the State of New York.

Since physical presence in the State, especially in the case of those under age, by no means constitutes legal residence, applicants who are at all doubtful of their own right to exemption should address inquiries in advance to the Director of Resident Instruction in the College of Agriculture.

No student is allowed to transfer from any free-tuition course to another course wherein tuition is charged without first paying the difference in tuition for the credit transferred.

Students in Agriculture who are not exempt under these provisions are required to pay $200 tuition for the regular year. Tuition-paying students transferring from the College of Agriculture to other colleges in the University must first make payment of the difference in tuition for the credit transferred. All students registered in the Summer Session, whether or not exempt in the other terms, pay a tuition fee of $55.

The tuition fee of $200 is payable in installments of $110 at the beginning of the first term and $90 at the beginning of the second term, but a student registered only for the second term of the academic year is required to pay at the rate of the first term.

Students desiring to take, while registered in the College of Agriculture, courses in other colleges in the University, beyond those specifically required and also beyond the twenty hours allowed free, may do so upon payment of tuition for the additional hours at the rate of tuition in the college in which the work is taken.

Tuition and other fees become due when the student registers. The University allows twenty days of grace after the last registration day of each term of the regular session. The last day of grace is generally printed on the registration coupon which the student is required to present at the Treasurer's office.

Any student, graduate or undergraduate, except as hereinafter provided, who fails to pay his tuition fees, and other indebtedness within the time prescribed by the University is thereby dropped from the University. When in his judgment the circumstances in a particular case so warrant, the Treasurer may allow an extension of time to complete payments. For such extension, the student will be assessed a fee of $2. A financial reinstatement fee of $5 will be assessed in the case of any student who is permitted to continue or return to classes after being dropped from the University for default in payments. For reasons satisfactory to the Comptroller and the Registrar, which must be presented in writing, the above assessment may be waived in any individual case.

The rules governing the rate of tuition in cases of withdrawal during the term or of registration late in the term are stated in the *General Information Number*.

Any tuition or other fee may be changed by the Board of Trustees to take effect at any time without previous notice.

Other Fees

A *matriculation fee* of $10 is required of every student upon entrance into the University. This fee must be paid at the time of registration. A new undergraduate student who has made the required deposit of $25 with the Treasurer does not make an additional payment of the matriculation fee, because the Treasurer draws on the deposit for this fee. See page 15.

A *University administration fee* of $5 is required of every student in the State colleges at the beginning of each term.

A *health and infirmary fee* of $6 a term is required of every student at the beginning of each term. For a statement of the privileges given in return for this fee, see the *General Information Number*.

A *Willard Straight Hall membership fee* of $5 a term is required of every undergraduate student at the beginning of each term. Its payment entitles the student to a share in the common privileges afforded by the operation of Willard Straight Hall, subject to regulations approved by the Board of Managers of the Hall. The fee of $5 a term is required of all graduate students except those who are members of the instructing staff, for whom membership is optional. The use of the hall is restricted to those who have paid this fee.

A *physical recreation fee* of $4 is required, at the beginning of each term, of every undergraduate. Its payment entitles a man student to the use of the gymnasium and the university playgrounds, and to the use of a locker, bathing facilities, and towels, in the gymnasium, the New York State Drill Hall, or the Schoellkopf Memorial Building; and a woman student to the use of the women's gymnasium, recreation rooms, and playgrounds, and to the use of a locker.

An *examination book fee* of $1 is required of every student at entrance to pay for the examination books furnished to the student throughout his course. The charge is made against the student's deposit fee.

A *graduation fee* is required, at least ten days before the degree is to be conferred, of every candidate for a degree. For a first, or baccalaureate, degree, the fee is $10; for an advanced degree it is $20.

Laboratory fees to cover the cost of materials used by the student are charged in courses that require work in laboratory, shop, or drafting room, or field work.

An average allowance of $30 a year will probably cover laboratory fees for most students, though for the first year a larger sum is likely to be required.

Deposits are made in advance at the Treasurer's office in some courses, particularly in Chemistry. Charges for materials used are

entered against the deposits, and at the end of the term any balance remaining is returned to the student.

Rules Governing Minor Delinquencies

Every student is held personally responsible for any injury done by him to any of the University's property.

Assessments, charged to the student's account and payable at the Treasurer's office, are levied upon the student in certain circumstances, under the following rules of the University.

A matriculated student desiring to register after the close of registration day must first pay a fee of $5.

A student desiring to file his registration of studies after the date set by his College for filing the same must first pay a fee of $2.

A student desiring to take an examination or other test for the completion of a course in which the grade "absent" or "incomplete" was reported must first pay a fee of $2 for each examination or other test.

A student desiring to make an appointment for the required medical examination or conference after twenty days from the last registration day of the term must pay a fee of $2.

For reasons satisfactory to the proper authority, any of the above-mentioned assessments (except that levied for examination or other test to complete a course) may be waived in any individual case if the student's failure to comply with the regulation was due to ill health or to any other reason beyond his control. Application for such a waiver should be made to the Secretary of the College, or, in the case of the medical examination, to the chairman of the Faculty Committee on Hygiene and Preventive Medicine.

BOARD AND LODGING

Halls and lodging for men. The University has twelve residential halls and houses for men, offering accommodations for about 725 students. For particulars, address the Manager of Residential Halls, Morrill Hall, Ithaca, New York.

Many private lodging houses near the University offer furnished rooms, with heat and light, at rates ranging from $3 to $5 a week for a single room. Before he rents a room in a private house, a student should make sure, by a personal inspection, that the sanitary arrangements of the house are good, and he should especially insist on a good fire escape. The University publishes a list of lodging houses which have been inspected and found to be satisfactory in the above respects; the list is ready for distribution on August 15. New students, if they have not already engaged rooms, are advised to come to Ithaca and do so a few days before the day for registration. The Freshman Advisory Committee offers its help to new students, and sends them a circular letter of suggestions about September 1.

Students rooming in university dormitories as well as those lodged in private houses will enter into written contracts. The details of these agreements should be clearly understood at the outset.

The number of private houses that offer both rooms and board is small, and most students get their meals outside the houses where they live. The University conducts a cafeteria in Willard Straight Hall, and the College of Home Economics also has a public cafeteria. There are other good cafeterias which are patronized mainly by students.

Board and lodging may be obtained in Ithaca for $11 a week, but this amount would best be regarded as the lowest practicable allowance.

Halls for women. All women students are required to live in the residential halls, Sage College and Prudence Risley Hall, reserved for juniors and freshmen, and four units of Balch Halls, reserved for sophomores and seniors. In these buildings the total cost of board, laundry, and rent of furnished room with heat and light, is $525. Exceptional circumstances which seem to make living outside of these buildings necessary should be taken up with the Dean of Women. Inquiries about board and rooms in the women's halls should be addressed to the Manager of Residential Halls, Morrill Hall, Ithaca, New York.

DEPARTMENTS OF INSTRUCTION

WITH OUTLINES OF COURSES THAT MAY BE CHOSEN BY REGULAR OR SPECIAL STUDENTS AS AGRICULTURAL ELECTIVES

Special Notices

The first term begins with the opening of the college year, in September. The second term begins in February. (See calendar, page 2.)

Unless otherwise noted, all courses are given in the buildings of the College of Agriculture. Courses inclosed in brackets will not be given in 1938–39.

Courses numbered from 1 to 100 are open to undergraduates generally; courses numbered from 101 to 200 are intended primarily for upperclassmen and graduates; courses numbered from 200 to 300 are intended primarily for graduates.

The main divisions of subject matter under which the courses are arranged are, for the most part, separate administrative units. The exceptions are bacteriology, which is administratively joined with dairy industry; meteorology, which goes with pomology; zoology, which goes with entomology and limnology; drawing, part of which goes with floriculture and ornamental horticulture and part with agricultural engineering; and the courses in wild-life conservation and game farming, which are given cooperatively.

ORIENTATION

Orientation. First term. Credit one hour. Required of all freshmen in Agriculture, T Th 10. Roberts 131.

A course designed to orient students in the life of the University.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

Farm Management

102. **Farm Management.** Second term. Credit five hours. Open to juniors and seniors who have satisfied the farm-practice requirement. It is desirable that this course should be preceded by as many as possible of the courses dealing with the production of crops and of animals. Lectures, M W F 10. Agricultural Economics Building 25. Laboratory, undergraduate students, T W Th or F 1.40–3.40; graduate students, F 4–6. Agricultural Economics Building 101. On days when farms are visited, laboratory periods for both undergraduates and graduates will be from 1.40–6. Assistant Professor Warren.

Farming as a business; types of farming; size of business; rates of production; labor efficiency; combination of enterprises; farm layout; building arrangement; machinery; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms. One all-day trip and four half-day trips are taken during April and May to visit farms in near-by regions. These trips are taken on the day of the regular laboratory period. Fee for materials furnished and for transportation on trips, $6.

103. **Farm Records and Accounts.** First term. Credit three hours. Lectures, T Th 8. Agricultural Economics Building 25. Laboratory, undergraduate students, M T or W 1.40–4; graduate students, W 1.40–4. Agricultural Economics Building 101 and 340. Assistant Professor Williamson.

Farm inventories; cash account; single-enterprise cost accounts; income-tax reports; complete farm cost accounts; interpretation of results of cost accounts and their application in the organization and management of farms. Fee for materials furnished, $3.

203. **Business Organization and Management of Successful New York Farms.** First term. Credit five hours. Prerequisite, course 102 or its equivalent. F 1.40–4, S 8–10. Agricultural Economics Building 101. Professor Scoville.

During October and November all-day trips are usually taken on Saturdays. Two two-day trips are taken, leaving Friday morning and returning Saturday night. Approximate expenses of trips, $20. Fee for materials furnished, $2.

205. **The Appraisal of Farm Land.** First term. Credit two hours. Primarily for graduate students. Open to seniors who have passed course 102 with a grade of 80 or better. Lecture, Th 11. Laboratory, T 1.40–4. Agricultural Economics Building 140. Assistant Professor WARREN.

A study of factors governing the price of land; land classification; the appraisal of land for use, for sale, for purposes of making loans, and for taxation. Fee for materials furnished, $1.

[207. **Research Methods in Farm Management.** First term. Credit one hour.] Professor ————. Not to be given in 1938–39.

Attention is given to the more important methods of determining the principles of farm management and the preparation of results for publication.

208. **Research Methods in Farm Management.** Second term. Credit two hours. Th 2–4. Agricultural Economics Building 140. Professor MISNER.

The course gives experience in the tabulation and the study of farm-management data and in preparing the results for publication. During the spring vacation several days are spent in taking farm-management survey records.

PRICES AND STATISTICS

Attention is directed to a new course arranged primarily for students in Agriculture, Mathematics 10 (Elementary Mathematics for Statistical Workers), and to Mathematics 83a and b (Probability and Statistics).

111. **Statistics.** First term. Credit three hours. Lecture, M 8. Agricultural Economics Building 125. Laboratory, M 1.40–4. Agricultural Economics Building 140 and 125. Professor PEARSON.

A study of the principles involved in the collection, tabulation, and interpretation of agricultural and marketing statistics. Analysis of statistical problems with an 80-column tabulating machine. Fee for materials furnished, $3.

112. **Statistics.** Second term. Credit three hours. Prerequisite, course 111. Lecture, M 8. Agricultural Economics Building 125. Laboratory, M 1.40–4. Agricultural Economics Building 140. Professor PEARSON.

A continuation of course 111. A study of the application of probable error; sampling; gross, partial, and multiple correlation; curve fitting to problems in this field. Methods of using 80-column tabulating equipment for multiple-correlation analysis. Fee for materials furnished, $3.

115. **Prices.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, T Th 9. Laboratory, W 1.40–4. Agricultural Economics Building 25. Professor PEARSON.

A study of prices of farm products in relation to agricultural and industrial conditions. Fee for materials furnished, $3.

BUSINESS MANAGEMENT

121. **Financial Statements.** First term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, T Th 9. Agricultural Economics Building 225. Discussion period, undergraduate students, S 8, 9, or 10. Agricultural Economics Building 201. Discussion period, graduate students, to be arranged. Professor POWELL.

Analysis and interpretation of the statements used to express financial condition and the results of business operations. Fee for materials furnished, $2.

122. **Accounting Method.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Prerequisite, course 121 or consent of instructor. Lectures, T Th 8. Agricultural Economics Building 225. Practice period, T or W 1.40–4. Agricultural Economics Building 201. Professor POWELL.

Recording business transactions, and deriving financial statements, analyses of costs and budgets. Fee for materials furnished, $1.

[125. **Business Management.** First term. Credit three hours. Open to juniors and seniors. Prerequisite, course 121 or consent of instructor. Professor POWELL.] Not given in 1938–39.

Factors affecting costs of operation, measures of efficiency, control of inventory and credit, sales, selection and compensation of employees, administrative structure, forms of ownership. Illustrations are drawn chiefly from the field of agricultural business. Fee for materials furnished, $2.

126. **Farmers' Cooperatives.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, W F 8. Agricultural Economics Building 225. Discussion groups, M at hours to be arranged. Agricultural Economics Building 201. Professor POWELL.

What cooperatives have tried to do and what they have done; their special problems of organization, finance, and control by farmers. Fee for materials furnished, $2.

127. **Business Law.** First term. Credit two hours. Open to juniors, seniors, and graduate students. Lectures, T Th 12. Agricultural Economics Building 225. Mr. ALLAN H. TREMAN.

Consideration is given chiefly to legal problems of particular interest to persons who expect to engage in business, including contracts, liens, mortgages, and negotiable instruments; ownership and leasing of property; wills; estates; inheritance taxation; and other practical problems.

229. **Agricultural Credit.** First term. Credit two hours. Open to advanced undergraduate students and graduate students. Lectures, T Th 10. Agricultural Economics Building 125. Professor W. I. MYERS.

A study of the credit institutions which serve agriculture. Fee for materials furnished, $1.

PUBLIC ADMINISTRATION AND FINANCE

135. **Local Government.** First term. Credit three hours. Lectures, W F 8. Agricultural Economics Building 225. Laboratory, Th 1.40–4. Agricultural Economics Building 201. Professor CATHERWOOD.

Historical development, organization, and operation of local government. Particular attention is given to receipts, expenditures, and administration of counties, towns, and school districts in New York. Fee for materials furnished, $2.

138. **Taxation.** Second term. Credit three hours. Open to juniors, seniors, and graduate students. Lectures, M W F 11. Agricultural Economics Building 25. Assistant Professor KENDRICK.

A study of the principles and practices of public finance with emphasis on taxation. Among the topics examined are: the growth of public expenditures; the changing pattern of federal, state, and local taxation; general-property, personal-income, inheritance, business, commodity, and motor-vehicle taxation; the incidence of taxation; relations among taxing units; and the problem of developing a system of taxation. Fee for materials furnished, $2.

235. **Financial Administration.** First term. Credit three hours. Primarily for advanced students. Time and room to be arranged. Professor CATHERWOOD.

Attention is given to various problems of governmental financial administration, with particular reference to New York. Emphasis is placed upon accounting systems and records; budgetary procedure; control of expenditures; purchasing; indebtedness; the assessment of property; tax limits; delinquent tax procedure; state aid; and financial reports. Fee for materials furnished, $2.

MARKETING

141. **Marketing.** First term. Credit four hours. Prerequisite, Economics 1. Lectures, M W F 8. Agricultural Economics Building 325. Discussion groups one hour a week. Professor BOYLE.

Present organization, functions, and operations of the market structure, with particular reference to agriculture. Fee for materials furnished, $2.

142. **Marketing Fruits and Vegetables.** First term. Credit four hours. Lectures, M W F 9. Agricultural Economics Building 225. Laboratory: W 1.40–4 primarily for undergraduate students. Th 4–6 primarily for graduate students. Agricultural Economics Building 140. Professor RASMUSSEN.

A study of the economic factors involved in the marketing of fruits and vegetables. Regional and seasonal competition; areas of distribution; methods of handling; costs of marketing; types of marketing organizations; sales methods; transportation and carrier services; produce law and methods of credit rating; terminal problems. Fee for materials furnished, $3.

242. **Methods and Results of Research in Marketing.** First term. Credit two hours. W 4–6. Agricultural Economics Building 140. Professor RASMUSSEN.

A critical study of research projects in marketing fruits and vegetables, and practice in planning such research.

143. **Marketing Dairy Products.** Second term. Credit four hours. Lectures, M W F 9. Agricultural Economics Building 225. Laboratory, undergraduate students, F 1.40–4; graduate students, Th 4. Agricultural Economics Building 201. Professor SPENCER.

A study of the marketing of fluid milk, cream, and other dairy products; economic geography of the industry; demand; supply; surplus; price plans and policies; costs of distribution; cooperative marketing; trade organization; public regulation. Fee for materials furnished and for transportation on trips, $4.

243. **Methods and Results of Research in Marketing.** Second term. Credit two hours. W 4–6. Agricultural Economics Building 201. Professor SPENCER.

A critical study of research projects in marketing dairy products and practice in planning such research.

144. **Marketing Poultry Products.** Second term. Credit three hours. Preferably to be preceded by Poultry Husbandry 50. Lectures, T Th 10. Agricultural Economics Building 225. Laboratory, T 1.40–4. Agricultural Economics Building 140. Doctor VAN WAGENEN.

A study of the economic factors involved in the marketing of eggs and poultry, including: areas of production; distribution channels; sales methods; market costs; cold-storage operations; legislation; demand; terminal-market and consumption problems. Fee for materials furnished, $2.

146. **The Organized Exchanges and Speculation.** First term. Credit two hours. Open to graduate students and seniors with adequate preparation. Recitations, T Th 8. Agricultural Economics Building 325. Professor BOYLE.

246. **Collective Bargaining.** Second term. Credit two hours. Open only to graduate students. Lectures, T Th 8. Agricultural Economics Building 330. Professor BOYLE.

Collective bargaining and its use by labor, capital, and agriculture. The policy of collective bargaining. A study in price determination.

147. **Marketing Trip to New York City.** Second term. Credit one hour. Given only if twenty students enroll at registration. Doctor VAN WAGENEN in charge. Representatives of other departments will cooperate in the course.

Five days of the spring vacation will be spent in New York City inspecting and studying the marketing of dairy products, eggs, poultry, fruits, vegetables, livestock, and meat.

Registration fee, $7, to cover hire of busses in New York City. Total cost of trip need not exceed $30 in addition to transportation to and from New York City.

RURAL ECONOMY

151. **Public Problems of Agriculture.** Second term. Credit two hours. Open to juniors, seniors, and graduate students. Lectures, T Th 11. Agricultural Economics Building 25. Professor ————————.

A discussion of some of the more important problems of agriculture that involve collective or governmental action. Fee for materials furnished, $1.

161. **Agricultural Economics.** Second term. Credit four hours. Prerequisite, Economics 1. Lectures, M W F 8. Agricultural Economics Building 325. Discussion groups one hour a week. Professor BOYLE.

A discussion of the major problems in the field of agricultural economics. A statement of these problems and the various solutions proposed. Fee for materials furnished, $1.

262. **Rural Economy, Elementary Course.** First term. Credit three hours. Prerequisite, an introductory course in economics. Lectures, M W F 9, and individual conferences. Agricultural Economics Building 325. Professor LAUMAN.

A study of the factors underlying the present conditions in rural communities at home and abroad, and of the forces at work in shaping the agriculture of the world, chiefly along economic lines.

263. **Rural Economy, Advanced Course.** Second term. Credit three or four hours. Prerequisite, course 262 or 161, or special permission. Lectures, M W F 9. Agricultural Economics Building 325. Professor LAUMAN.

A more extended study, primarily theoretical, of the general economic problems of agriculture.

264. **Planning for Agriculture.** Second term. Credit three hours. Prerequisite, at least junior standing, and an elementary knowledge of agriculture. Lectures, T Th 9. Agricultural Economics Building 325. Professor LAUMAN.

A study of agricultural policies and plans for the rehabilitation and redirection of agriculture in various countries of the world.

269. **Rural Economy Seminar.** First and second terms. Primarily for graduate students, and for seniors (with credit) by invitation. T 2.30. Agricultural Economics Building 316. Professor LAUMAN.

HISTORY OF AGRICULTURE

171. **History of Agriculture.** First term. Credit three hours. Prerequisite, junior standing and an elementary knowledge of agriculture, or special permission of the instructor. Lectures, M W F 11. Agricultural Economics Building 325. Professor LAUMAN.

The important phases of the development of agriculture are considered historically. Stress is laid on the development of the agricultural classes, on rational agriculture, and on modern agrarian problems.

172. **History of Agriculture in the United States.** Second term. Credit three hours. Prerequisite, junior standing. Lectures, M W F 11. Agricultural Economics Building 325. Professor LAUMAN.

This course deals with the land, its settlement, and its settlers in their economic, social, and political aspects; the technical development of agriculture; the beginnings of permanent agriculture; the rise of marketing problems and of the agrarian movements.

278. **Research in Rural Economy or History of Agriculture.** First and second terms. Credit two or three hours a term. For seniors, by permission, and for graduate students. Agricultural Economics Building 316. Professor LAUMAN.

279. **Agricultural History Seminar.** First and second terms. Primarily for graduate students and for seniors (with credit) by invitation. Th 2.30. Agricultural Economics Building 316. Professor LAUMAN.

DEPARTMENTAL SEMINAR

299. **Seminar.** First and second terms. Open only to graduate students. M 4. Agricultural Economics Building 401. Departmental staff.

AGRICULTURAL ENGINEERING

1. **Farm Mechanics.** First or second terms. Credit three hours. Prerequisite, reasonable proficiency in drawing; Drawing 1 recommended. Lectures: first term, T Th 9, Dairy Industry Building 218; second term, T Th 10, Dairy Industry Building 218. Practice: first term, M T or W 1.40–4; second term, M or T 1.40–4. Agricultural Engineering Laboratories. Professor RILEY and Assistant Professor WRIGHT.

A course planned to give training in understanding the farm application of mechanical methods and appliances and to develop ability to think and to reason in terms of these. Laboratory fee, $2.

101. **Electricity on the Farm.** Second term. Credit three hours. Lectures, M W 11. Dairy Industry Building 119. Practice, W 1.40–4. Agricultural Engineering Laboratories. Assistant Professor WRIGHT.

A course intended to give some practical knowledge of electricity and of its uses in the home and on the farm. (If possible a field trip to Niagara Falls power plants will be arranged at excursions rates.) Laboratory fee, $2.50.

102. **Farm Power Machinery.** Second term. Credit three hours. For seniors and juniors. Prerequisite, course 1 and Drawing 1 or their equivalent. Lectures, W F 8. Dairy Industry Building 119. Practice, Th or F 1.40–4. Agricultural Engineering Laboratories. Professor FAIRBANKS.

A study of multicylinder internal-combustion engines as they are used in the tractor, truck, and automobile, tractor plows, other field power machinery, and electric power machinery, such as ensilage cutters, feed grinders, and hay hoists. Laboratory fee, $3.

10. **Household Mechanics.** First or second term. Credit three hours. For women students. Lectures, T Th 12. Caldwell 143. Practice, Th or F 2–4.30. Agricultural Engineering Laboratories. Professor ROBB and Assistant Professor WRIGHT.

A course intended to develop ability to think and to reason in terms of mechanical devices. Among the problems selected for this training are exercises in plumbing, soldering, and power transmission, and studies in the principles of operation, care, and repair of small mechanical devices, sewing machines, domestic electrical equipment, and automobile engines. Laboratory fee, $2.

21. **Farm Engineering.** First or second term. Credit three hours. It is recommended but not required that students have training in mechanical drawing. Lectures: first term, M W 9; second term, M W 10. Dairy Industry Building 119. Practice, M or T 1.40–4. Dairy Industry Building, Fourth Floor, and field. Professor MCCURDY.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; leveling for farm drainage and water supply; laying out building foundations. Farm drainage, concrete, and sewage disposal are studied. Laboratory fee, $2.

[121. **Farm Engineering, Advanced Course.** Second term. Credit two hours. Alternates with course 122. Prerequisite, course 21 or its equivalent. Professor MCCURDY.] Not given in 1938–39.

A course in topographic surveying and mapping; leveling, including cross-section and earthwork computations; a study of the use and adjustments of the better class of levels and of the transit. Laboratory fee, $1.

122. **Drainage and Irrigation.** Second term. Credit two hours. Alternates with course 121. Prerequisite, course 21 and Agronomy 1 or their equivalents. Lecture, T 10. Dairy Industry Building 119. Field work, W 1.40–4. Professors ROBB and MCCURDY.

A course covering the principles and practice of drainage and irrigation; laying out drainage for farm lands, golf courses, gardens, and roads; a study of irrigation systems for humid climates; pumping plants for drainage, irrigation, and water supply. One two-day excursion to drainage projects near Ithaca is taken sometime in May. Laboratory fee, $1.

24. **Farm Concrete.** First term. Credit two hours. Lecture, T 11. Dairy Industry Building 119. Practice, Th or F 1.40–4. Agricultural Engineering Laboratories. Professor MCCURDY.

A study of the selection, testing, and proportioning of the materials used in making concrete; building forms; mixing, placing, finishing, and curing concrete; waterproofing; inspection of local sand and gravel banks and of some local concrete structures. Laboratory fee, $2.

31. **Farm Structures.** First term. Credit three hours. Drawing 1 recom-

mended. Lectures and recitations, M W F 8. Comstock 145. Extension Professor GOODMAN.

A study of the layout and structure of the buildings suited to various types of farming, with emphasis on the planning, construction, insulation, ventilation, maintenance, and remodeling of dairy, poultry, sheep, swine, and general-purpose buildings. Materials fee, 50 cents.

40. **Farm Shop Work.** First or second term. Credit two hours a term. Open to all students. First term: section 1, T Th 1.40–4; section 2, M F 1.40–4. Second term: T Th 1.40–4. Agricultural Engineering Laboratories. Professor ROEHL.

This course includes woodworking, with special jobs in carpentry, cabinet making, and fitting tool handles; metal working, with special jobs in saw fitting, tool grinding, cold-metal working, sheet-metal working, selecting and attaching builders' hardware; forge work, with special jobs in shaping and tempering tools; painting, with special jobs in repairing and refinishing furniture; harness repairing; problems in the use of rope. Mechanical drawing and free-hand sketching are done as they supplement the work. Laboratory fee, $4.

41. **Shop Work for Rural High School Teachers.** First or second term. Credit three hours. Prerequisite, course 40. W 1.40–4 and S 8–12.50. Agricultural Engineering Laboratories. Professor ROEHL.

A course offering training for teaching in rural high schools general shop work related to agriculture. The course includes presentation of purpose, plans, and equipment of shops, organization of course of study, and methods of teaching. In the course one learns how to teach the work outlined in course 40 and other work pertaining to rural life. Laboratory fee, $4.

46. **Household Carpentry, Furniture Repairing and Refinishing.** Second term. Credit two hours. For women students. Practice, M F 2–4.30. Agricultural Engineering Laboratories. Professor ROEHL.

A course in such carpentry-tool work as a housekeeper can make use of; the making and finishing of several small pieces of furniture; each student to refinish a few pieces of furniture supplied by her, and do such repairing as may be necessary. Laboratory fee, $3.

47. **Farm Blacksmithing.** First or second term. Credit one hour. Freshmen must obtain permission to register from the Farriery office. Practice, M or W 1.40–4. Farriery, Veterinary College. Professor ASMUS.

Welding of iron and ordinary steel such as is used in the parts of modern farm machinery; sharpening, shaping, and tempering of steel tools; miscellaneous forging, such as chain hooks, links, and so forth; horseshoeing for those interested and competent. Laboratory fee, $3.

48. **Advanced Farm Blacksmithing.** First or second term. Credit one or two hours. Prerequisite, course 47 and permission to register. Practice, by appointment. Farriery, Veterinary College. Professor ASMUS.

Advanced work in forging and horseshoeing. Laboratory fee, $3 for each credit hour.

251. **Special Problems in Agricultural Engineering.** First or second term. Credit one or more hours. Prerequisite, adequate ability and training for the work proposed, and permission to register. Professors and assistant professors of the department.

Special work in any branch of agricultural engineering on problems under investigation by the department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained.

252. **Seminar.** First and second terms. Credit one hour a term. Open to seniors and required of graduate students. M 4.30–5.45.

Presentation and discussion of papers on special problems in agricultural engineering. Departmental staff.

AGRONOMY

SOIL SCIENCE

1. **The Nature and Properties of Soils.** First or second term. Credit five hours. Prerequisite, Chemistry 102 or 104 and Geology 100. Lectures, M W F 9.

Caldwell 100. Laboratory: M T W Th or F 1.40–4. Caldwell 49. Two recitations, to be arranged. Caldwell 31. Professor BUCKMAN and Assistant Professor CUMMINGS.

A comprehensive course dealing with the composition, properties, and plant relations of soils, with particular reference to the fundamental principles of maintaining soil fertility. Laboratory fee, $3.

[3. **Practical Soil Management.** First term. Credit three hours. Given in alternate years. Prerequisite, course 1. Professor WORTHEN.] Not given in 1938–39.

A practical course dealing with methods of soil utilization, including the use of lime, commercial fertilizers, stable manure, and green-manure crops, in agricultural practice. Particular stress is placed upon factors essential for the practical utilization of New York soils.

101. **Origin, Morphology, Classification, and Mapping of Soils.** Second term. Credit three hours. Prerequisite, course 1. Lectures, T Th 9. Caldwell 100. Professor HOWE.

A course dealing with the characteristics of the great soil groups, with particular reference to the soils of the United States. Attention is given to the origin and the classification of New York soils, based upon study of their morphology. A field study of soils and mapping is made. Laboratory fee, $3.

102. **Soil Conservation.** Second term. Credit two hours. Prerequisite, courses 1 and 11. Lectures, M W 10. Caldwell 143. Professor GUSTAFSON.

An analysis of the causes of the decline in the inherent productivity of soils and of the practical methods of management that will permanently maintain their productivity. The causes of erosion and its control by agronomic methods receives special emphasis. Two all-day Saturday field trips. Laboratory fee, $4.

[103. **Organic Soils.** First term. Credit two hours. Prerequisite, course 1 and Chemistry 201. Given in alternate years. Professor B. D. WILSON.] Not given in 1938–39.

A course designed primarily for students specializing in soil technology. Emphasis is placed on the composition and properties of organic soils.

104. **Forest Soils.** First term. Credit two hours. Prerequisite, course 1 and Botany 31. Given in alternate years. Hours to be arranged. Caldwell 492. Assistant Professor CHANDLER.

Assigned readings and semi-weekly discussions of the more important forest-soils literature. There are occasional field trips.

205. **Soil Fertility, Advanced Course.** First term. Credit three hours. Prerequisite, course 1 and Chemistry 201 or its equivalent. Lectures, T Th S 8. Caldwell 143. Professor BIZZELL.

The lectures are supplemented by reviews of literature and by the preparation of abstracts.

106. **Soil Microbiology.** Second term. Credit three hours. Prerequisite, course 1, Bacteriology 1, and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, W or F 1.40–4. Caldwell 201. Professor J. K. WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, $5.

207. **Physical and Chemical Properties of Soils: Lectures.** Second term. Credit three hours. Prerequisite, course 1, Physics 3 and 4, Chemistry 201. A course in physical chemistry is recommended. Lectures, T Th S 8. Caldwell 143. Professor BRADFIELD.

A study of physical and chemical processes and changes that take place in soils, with emphasis upon their practical application and significance.

208. **Physical and Chemical Properties of Soils: Laboratory.** Second term. Credit three hours. Must be preceded or accompanied by course 207. Laboratory, M W 1.40–4. Caldwell 294. Professor BRADFIELD and Assistant Professor STAKER.

Laboratory practice in the use of physical and physico-chemical technics used in soil investigations. Laboratory fee, $5.

209. **Research in Soil Science.** Throughout the year. Professors BIZZELL, BRADFIELD, BUCKMAN, CONN, GUSTAFSON, J. K. WILSON, B. D. WILSON, and HOWE, and Assistant Professors CHANDLER, CUMMINGS, and STAKER.

FIELD CROPS

11. **Production of Field Crops.** First or second term. Credit four hours. Prerequisite, course 1 and Botany 1. First term: Lectures, M W F 10, Caldwell 100; Laboratory, T W or Th 1.40–4, Caldwell 250. Second term: Lectures, M W F 11, Caldwell 100; Laboratory, T W 1.40–4. Caldwell 250. Professor HARTWIG.

A course dealing principally with the crops that are used for feeding livestock and poultry. Emphasis is placed on the hay, silage, pasture, and grain crops of the Northeastern States. Cultural methods, crop rotations, fertilizer practices, soil and climate adaptation, and the better varieties of the important crops, are considered. Laboratory fee, $3.

[211. **Field Crops. Advanced Course.** Second term. Credit two hours. Prerequisite course 11 and Botany 31 or their equivalent. Given in alternate years. Professor HARTWIG. Not given in 1938–39]

A literature course organized to meet the needs of students specializing in field crops. Current problems involving crops other than pasture are considered. The emphasis is on forage crops. In addition to lectures, papers are assigned for reading and abstracting.

212. **Pastures.** Second term. Credit three hours. Prerequisite, courses 1 and 11 or their equivalent. Lectures and discussions, T Th 9. Caldwell 143. Laboratory, S 9–11. Assistant Professor JOHNSTONE-WALLACE.

Special attention is devoted to the principles involved in the improvement and management of pastures in humid temperate climates. Current literature is studied.

219. **Research in Field Crop Production.** Throughout the year. Professor HARTWIG and Assistant Professor JOHNSTONE-WALLACE.

DEPARTMENTAL SEMINAR

290. **Seminar.** Throughout the year. Required of graduate students taking work in the Department. S 11–12.30. Caldwell 143.

ANIMAL HUSBANDRY

Students intending to specialize in animal husbandry are advised to register for courses 1, 10, and 20 before taking the more advanced courses.

1. **Livestock Production.** First term. Credit three hours. Lectures, W F 10. Agricultural Economics Building 25. Laboratory, T Th or F 1.40–4, or W 11–1. Judging Pavilion. Professors HARRISON, HINMAN, and SAVAGE, Assistant Professors SALISBURY and J. P. WILLMAN, Doctor J. I. MILLER, and assistants.

Introduction to types, breeds, judging, and management of livestock. Laboratory fee, $2.

10. **Livestock Feeding.** First or second term. Credit four hours. Must be preceded or accompanied by Chemistry 102 or 104. First term: Lectures, M W F 11. Wing A. Laboratory, Th or F 1.40–4. Wing C. Doctor J. I. MILLER and assistants. Second term: Lectures, M W F 9. Wing A. Laboratory, T W Th or F 1.40–4. Wing C. Professor MORRISON, Doctor J. I. MILLER, and assistants.

The feeding of farm animals, including the general basic principles, feeding standards, the computation of rations, and the composition and nutritive value of livestock feeds.

110. **Animal Nutrition.** First term. Credit three hours. For advanced and graduate students. Prerequisite: course 10, Home Economics 122, or Poultry Husbandry 110; a course in human or veterinary physiology; and a course in organic chemistry. Lectures, M W F 10. Wing B. Professor MAYNARD.

The chemistry and physiology of nutrition and the nutritive requirements for growth, reproduction, lactation, and other body functions.

111. **Animal Nutrition, Laboratory Course.** First term. Credit two or three hours. Must be preceded or accompanied by course 110. Registration by permission. M W F 1.40–4. Animal Nutrition Laboratory, Dairy Industry Building. Professor McCAY.

This course is designed to familiarize the student with the application of chemical methods to the solution of fundamental problems of nutrition. Laboratory fee, $10; breakage deposit, $5.

213. **Biochemistry of Lactation.** Second term. Credit one hour. Given in alternate years. Prerequisite, course 110. One meeting a week at an hour to be arranged. Professor MAYNARD and Doctor ELLIS.

A discussion of the biochemistry of the processes involved in milk secretion and of the composition of milk as related to diet and to the blood precursors.

215. **Animal Nutrition, Advanced Course.** First term. Credit one hour. Prerequisite, course 110 and permission to register. One meeting a week at an hour to be arranged. Dairy Industry Building 160. Professor McCAY.

Lectures and conferences on the nutrition of animal species from the invertebrate to man, with special emphasis upon the fundamental discoveries in such fields as growth, comparative biochemistry, and physiology that have been synthesized into the modern science of nutrition.

219. **Seminar in Animal Nutrition.** First and second terms. Open to graduate students only. Registration by appointment. Assigned readings on selected topics, with weekly conferences. M 4.15. Professors MAYNARD, McCAY, and NORRIS.

A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. **Animal Breeding.** First term. Credit three hours. Prerequisite, course 1 and either Botany 1, Biology 1, or Zoology 1. Lectures, M W 9. Recitation, demonstration, or laboratory, M or T 1.40–4. Wing A and C. Professor ASDELL and assistant.

A general outline of the principles of physiology and heredity as applied to the breeding of farm animals. Laboratory fee, $2.

[120. **Problems in Animal Genetics.** First term. Credit three hours. Prerequisite, course 20 or Plant Breeding 101. Professor ————.] Not given in 1938–39.

Lectures, conferences, and reports, including statistical methods as applied to breeding animals. The work will consist largely of practice in making reports on statistical problems.

125. **Endocrinology, Reproduction, and Lactation.** Second term. Credit two hours. Lectures, M W 10. Wing A. Professor ASDELL.

A general course in endocrinology, with more detailed consideration of the endocrine processes involved in reproduction and lactation.

229. **Seminar in Animal Breeding.** First and second terms. F 4.15. Poultry Husbandry Building 201. Professors HUTT and ASDELL, and members of Poultry Husbandry and Animal Husbandry Staffs.

30. **Health and Diseases of Animals.** First term. Credit three hours. Not open to freshmen or to those who have had no courses in animal husbandry. Lectures, M W F 11. Veterinary College. Professor BIRCH.

The course is designed to give the student a clear conception of the causes and nature of the diseases of animals, with suggestions for their prevention. Special attention is given to the methods of preventing the spread of the infectious and epizootic diseases. Such information as is practicable is given for the treatment of slight injuries and for first aid in emergencies.

40. **The Horse.** Second term. Credit three hours. Lectures, T Th 9. Wing B. Practice, W 1.40–4. Judging Pavilion. Assistant Professor SALISBURY.

A general course treating of the horse and the mule. Judging, care and management, economy in feeding, breeding, and stable management, including harnessing, hitching, and the like. Origin, history, and development of the breeds of horses. Laboratory fee, $2.

41. **Livestock Judging, Beef Cattle, Horses, Sheep, and Swine.** Second term. Credit three hours. The course should preferably be taken in the junior year. Prerequisite, course 1. Laboratory and lecture periods, M Th 1.40–4.50. Judging Pavilion and Livestock Barns. Doctor J. I. MILLER.

A course in judging market and breeding classes of beef cattle, horses, sheep, and swine. One field trip of about two-days duration is made to give additional opportunities to judge livestock in outstanding herds or flocks. Laboratory fee, $2.

42. **Advanced Livestock Judging: Beef Cattle, Horses, Sheep, and Swine.** First term. Credit two hours. Prerequisite, course 41. Registration by permission. Laboratory periods, T F 1.40–4.50. Judging Pavilion and Livestock Barns. Doctor J. I. MILLER.

A course in judging market and breeding classes of beef cattle, horses, sheep, and swine. Intended primarily to give additional training to successful students of course 41. Members of this group are selected to represent the institution in intercollegiate judging competitions. Laboratory fee, $2.

50. **Dairy Cattle.** Second term. Credit three hours. Lectures, T Th 10. Wing A. Practice, M or Th 1.40–4. Wing A and Judging Pavilion. Professors SAVAGE and HARRISON, and assistants.

Origin, history, and development of the breeds of dairy cattle; methods of breeding; economy of feeding; production of milk; care, management, and sanitation of the dairy herd. Practice in judging, scoring, tracing pedigrees, and keeping records. Laboratory fee, $2.

51. **Advanced Judging, Dairy Cattle.** Second term. Credit one hour. Must be preceded or accompanied by course 50. Saturdays after Easter recess. One two-day trip is required. Hours by appointment. Successful students may also register for one hour in the succeeding fall term. Professor HARRISON.

150. **Dairy Cattle, Advanced Course.** Second term. Credit two hours. Prerequisite, course 50. Lecture, W 11. Practice, W 1.40–4. Wing E. Professor HARRISON.

Analysis of breeding operations in successful breeding establishments. Formulating a breeding program. Selection of foundation females and herd bulls, and special problems in the feeding and management of the purebred dairy herd.

60. **Beef Cattle.** Second term. Credit three hours. Lectures, W F 9. Wing C. Practice, W 1.40–4. Beef Cattle Barn. Professor HINMAN.

Origin, history, and development of the breeds of beef cattle; herd management; feeding for fattening; practice in judging. Lectures, recitations, discussions, reports, tracing of pedigrees, and field trips. Estimated cost of trips, $6. Laboratory fee, $2.

70. **Swine.** Second term. Credit three hours. Lectures, W F 11. Wing C. Practice, T 1.40–4. Judging Pavilion. Assistant Professor J. P. WILLMAN.

Origin, history, and development of the breeds of swine; herd management; practice in judging swine; and reports on assigned topics. Lectures, recitations, discussions, and field trips intended to give the student a knowledge of the feeding, management, production, and marketing of swine. Estimated cost of trips, $4. Laboratory fee, $2.

80. **Sheep.** First term. Credit three hours. Lectures, T Th 10. Wing B. Practice, M 1.40–4. Judging Pavilion. Assistant Professor J. P. WILLMAN.

Origin, history, and development of the breeds of sheep; flock management; feeding and fattening lambs; practice in judging. Lectures, recitations, discussions, reports, and field trips intended to give the student a knowledge of the management, production, and marketing of sheep and lambs. Estimated cost of trips, $4. Laboratory fee, $2.

90. **Meat and Meat Products.** First or second term. Credit three hours. Not open to freshmen. Lecture, M 8. Wing B. Two laboratory periods a week, W 1.40–4 and a choice of M or T 1.40–4. Wing B and Meat Laboratory. One required inspection trip to Buffalo stockyards and slaughterhouses. Professor HINMAN and Mr. SCHUTT.

A course in the slaughtering of farm animals, the cutting of carcasses, and the preparation and curing of meats. Laboratory fee, $2.

91. **Meat and Meat Products.** First or second term. Credit two hours. Open to sophomores, juniors, and seniors in Hotel Administration only. Lecture, M 8. Wing B. Laboratory period, M or T 1.40–4. Wing B and Meat Laboratory. One required trip as in course 90. Professor HINMAN and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. Laboratory fee, $2.

92. **Meat and Meat Products.** First or second term. Credit one hour. Open especially to the students of the College of Home Economics. Registration limited to fifteen students a section. Laboratory and lecture period, Th or F 2–4.20. Wing B and Meat Laboratory. Professor HINMAN and Mr. SCHUTT.

A course in wholesale and retail buying, cutting, curing, and preparation of meats. Laboratory fee, $2.

93. **Meat Cutting.** First or second term. Credit one hour. Prerequisite, course 90, 91, or 92. Enrollment limited to five students a section. Laboratory and lecture period, T Th or S 8–10.30. Meat Laboratory and Meat Lecture Room. Professor HINMAN and Mr. SCHUTT.

A course dealing with the principles and practice of meat selection, cutting, and wrapping. Laboratory fee, $2.

200. **Research.** First and second terms. Credit and hours by arrangement. For advanced students only. Professors MORRISON, MAYNARD, SAVAGE, MCCAY, HARRISON, ASDELL, and HINMAN and Assistant Professors J. P. WILLMAN and SALISBURY.

The amount of the laboratory fee depends upon the nature of the problem undertaken.

201. **Seminar.** First and second terms. Required of all graduate students taking either a major or a minor subject in Animal Husbandry. Advanced undergraduates will be admitted by permission, and, if a satisfactory report on an approved subject is presented, may receive not to exceed two-hours credit. M 11. Professor MORRISON and departmental staff.

BACTERIOLOGY

Exemption from the farm-practice requirement because of specialization in bacteriology will be granted only to those students who follow the prescribed courses outlined by the department, whose record in all courses taken in the university approximates an average of 82, and whose record in courses in bacteriology is entirely satisfactory.

1. **General Bacteriology.** First term. Credit six hours. Prerequisite, Chemistry 102 or 104. Lectures, recitations, and laboratory practice, M W F 1.40–5. Dairy Industry Building 218 and 301. Professor STARK, Mrs. STARK, Mr. GUNSALUS, and assistants.

An introductory course; a general survey of the field of bacteriology, with the fundamentals essential to further work in the subject. Laboratory fee, $15.

3. **Agricultural Bacteriology.** First term. Credit three hours. Not accepted as prerequisite for advanced courses. Primarily for freshmen and two-year students. Lectures, M W F 9. Dairy Industry Building 218. Professor STARK.

The elements of bacteriology, with a survey of the relation of microorganisms to agriculture.

[4. **Household Bacteriology.** Second term. Credit three hours. Given in alternate years. Prerequisite, Elementary Chemistry. Not accepted as a prerequisite for advanced courses. Professor STARK and Mrs. STARK.) Not given in 1938–39.

An elementary, practical course for students in Home Economics. Laboratory fee, $10.

103. **Applied Bacteriology.** Second term. Credit six hours. Prerequisite, course 1, quantitative analysis, and organic chemistry. Lectures, recitations, and laboratory practice, M W F 1.40–5. Dairy Industry Building 119 and 301. Professor SHERMAN and Messrs. GUNSALUS and NIVEN.

An advanced course dealing with the important groups of bacteria that are of significance in water, milk, and foods, together with the methods used in the bacteriological analysis and control of these products. Laboratory fee, $15.

105. **Higher Bacteria and Related Microorganisms.** First term. Credit four hours. Prerequisite, course 1. Lectures, recitations, and laboratory practice, T Th 1.40–5. Dairy Industry Building 119 and 323. Assistant Professor KNAYSI and Mr. LAMANNA.

A study of the higher bacteria, together with the yeasts and molds that are of especial importance to the bacteriologist. Laboratory fee, $15.

106. **Soil Microbiology.** (Same as Agronomy 106.) Second term. Credit three hours. Prerequisite, course 1, Agronomy 1, and Chemistry 201 or its equivalent. Lectures, M W 8. Caldwell 143. Laboratory, W or F 1.40–4. Caldwell 201. Professor J. K. WILSON.

A course in biological soil processes designed primarily for students specializing in soil technology or bacteriology. The laboratory work is supplemented by reports and by abstracts of important papers on the subject. Laboratory fee, $5.

Pathogenic Bacteriology. (See the *Announcement of the New York State Veterinary College.*)

210. **Physiology of Bacteria.** Second term. Credit two hours. Prerequisite, course 1 and at least one additional course in bacteriology. Lectures, W F 11. Dairy Industry Building 120. Professor RAHN.

An advanced course in the physiology of bacteria and the biochemistry of microbic processes.

210a. **Physiology of Bacteria, Laboratory.** Second term. Credit three hours. Must be preceded or accompanied by course 210. M 11 and M W 1.40–5. Dairy Industry Building. Professor RAHN and Mr. HEGARTY.

An advanced laboratory course dealing with the biological principles of growth, fermentation, and death of bacteria. Laboratory fee, $15.

211. **Taxonomy of Bacteria.** First term. Credit two hours. Prerequisite, four terms of bacteriology. Lecture, T Th 8. Dairy Industry Building 120. Professor RAHN.

An advanced course dealing with the natural groups and variability of bacteria, with a study of the systems of nomenclature and classification.

212. **Bacteriological Literature.** Throughout the year. Credit one hour a term. For seniors and graduate students. F 8. Dairy Industry Building 120. Professor RAHN.

Presentation and discussion of current literature in bacteriology.

213. **Morphology and Cytology of Bacteria.** First term. Credit two hours. For seniors and graduate students. Lectures, W F 4.40. Dairy Industry Building 119. Assistant Professor KNAYSI.

The morphology, cytology, and microchemistry of microorganisms.

220. **Research.** First or second term. Credit one or more hours, by arrangement. For advanced students.

Special problems in any phase of bacteriology may be elected.

221. **Seminar.** Throughout the year. Without credit. Required of graduate students specializing in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

BOTANY

Students wishing instruction in special groups of plants or in special subjects should consult the department.

1. **General Botany.** Throughout the year. Credit three hours a term; both terms of the course must be completed to obtain credit, unless the student is excused by the department. If taken after Biology 1, credit two hours a term. Lectures, T Th 9 or 11. Plant Science 233. Laboratory, one period of two and one-half hours. Plant Science 240, 242 and 262. Professor PETRY, Doctors LAUBENGAYER and PALMQUIST, Messrs. BANKS, JUSTICE, PALMATIER, WILLIAMS and BERNSTEIN, and Miss ANDERSON.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants. Laboratory fee, $3.50 a term.

102. **Advanced General Botany.** First term. Credit four hours. Prerequisite, course 1 or its equivalent. Lectures, T Th 9. Plant Science 336. Laboratory, T Th 10–12.30. Plant Science 228. Doctor PALMQUIST.

A course dealing broadly with green plants, their morphology, life histories, classification, distribution, and relation to their surroundings. With Plant Physiology (Botany 31) this course forms a general second-year course in botany. Registration limited to twenty. Laboratory fee, $5.

13. **Trees and Shrubs.** First term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, T 8. Plant Science 143. Laboratory or field work, M W or T Th 1.40–4. One all-day field trip is required. Plant Science 211. Professor MUENSCHER and Mr. BANKS.

The identification of trees and shrubs in summer and in winter conditions. During the first part of the term the work covering identification is done largely in the field. The work of the latter part of the term is a study of the taxonomy of woody plants. Laboratory fee, $3.

53. **Poisonous Plants.** Second term. Credit one hour. Registration by permission. Discussion and demonstrations, F 1.40–4. Plant Science 353. Professor MUENSCHER and Mr. JUSTICE.

Special emphasis is placed on the identification, poisonous properties, and distribution of poisonous plants. Laboratory fee, $2.

55. **Weed Identification and Control, and Seed Analysis.** First term. Credit three hours. Prerequisite, course 1 or its equivalent. Lecture, S 8. Plant Science 143. Laboratory, F 1.40–4 and S 9–11.20. Plant Science 353. Professor MUENSCHER and Mr. JUSTICE.

Special emphasis is given to the habits, characteristics, and properties which make weeds harmful or undesirable, the losses and injury produced by them, and the method for their prevention, eradication, and control. Field and laboratory practice in the identification of weeds and seeds and practice in the recognition of seed impurities are provided. Students wishing to do additional or special work on seed analysis or testing may register in course 145. Laboratory fee, $3.

215. **Seminar in Economic Botany.** First term. Hours to be arranged. Open to qualified students. Professor MUENSCHER.

The subject for 1938–39 relates to aquatic plants.

117. **Taxonomy of Vascular Plants.** Second term. Credit four hours. Prerequisite, course 1 or its equivalent. Lecture, M 9. Plant Science 143. Laboratory, M W F 1.40–4. Plant Science 211. Professor WIEGAND.

A study of the kinds of seed plants and ferns, their classification into genera, families, and orders, and field work on the local flora. Emphasis is placed on wild plants, but the more common cultivated plants receive some attention. The course is planned to follow course 1 and to furnish an introduction to the knowledge of field botany and classification of the higher plants, in preparation for special work in various departments, and as an aid in teaching. Instruction is given in the preparation of an herbarium and of keys. Laboratory fee, $4; deposit, $5.

Students completing this course may arrange, under course 145, to pursue special advanced work in taxonomy.

219. **Advanced Taxonomy of Vascular Plants.** Second term. Credit two hours. Prerequisite, course 117 or its equivalent. Open only to major students in botany and graduate students. Hours to be arranged. Plant Science 211. Professor WIEGAND.

Special round-table discussion of topics of particular interest to the taxonomist. One hour is devoted to practical work on some group of plants.

[123. **Plant Anatomy.** Second term. Credit four hours. Prerequisite, course 1 or its equivalent, and permission to register. Professor EAMES.] Not given in 1938–39.

This course is designed to give a working acquaintance with the internal morphology of vascular plants, and emphasis is placed on practice in interpretation and determination of material. The course is planned primarily for students in applied fields of botany, such as pathology, pomology, or genetics. Students desiring a less detailed training in this subject should take course 126. Laboratory fee, $5.

124. **Cytology.** First term. Credit four hours. Prerequisite, course 1 or Zoology 1 or its equivalent. Lectures, M W 9. Plant Science 233. Laboratory, M W or T Th 10–12.30 or T Th 1.40–4. Assignment to laboratory section must be made at time of registration. Plant Science 219. Professor L. W. SHARP

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, and heredity. Both plant and animal materials are used. Microtechnic is not included. Laboratory fee, $5.

224. **Advanced Cytology.** Second term. Credit two hours. Prerequisite, course 124, Plant Breeding 101, and permission to register. Lecture, W 9. Plant Science 141. Laboratory and seminar to be arranged. Plant Science 228. Professor L. W. SHARP.

An advanced course dealing mainly with the physical basis of heredity and with recent researches in cytogenetics.

125. **Microtechnical and Microscopical Methods.** Second term. Credit five hours. Prerequisite, permission to register. Lectures and demonstrations, T Th 11–1. Plant Science 211. Three laboratory periods to be arranged. Plant Science 219. Doctor de TOMASI.

A course for advanced students who require training in the preparation of plant and animal materials for histological or cytological study and desire a foundation in the field of microscopy as applied to biological problems. Laboratory fee, $10. Additional supplies for special individual work to be paid for by the student.

126. **Morphology of Vascular Plants.** Second term. Credit three hours. Prerequisite, courses 1 and 102 or their equivalent, and permission to register. Lecture, T 9. Plant Science 143. Laboratory, T Th 10–12.30. Plant Science 228. Professor EAMES.

An advanced course in the comparative morphology, life histories, and phylogeny of vascular plants. Laboratory fee, $5.

Comparative Morphology of Fungi. Given in the Department of Plant Pathology.

31. **Plant Physiology.** First or second terms. Credit four hours. Prerequisite, course 1 and introductory chemistry. Lectures, T Th 10. Plant Science 233. Laboratory, T Th 1.40–4 or W F 1.40–4. Plant Science 227. Professors KNUDSON or O. F. CURTIS, Assistant Professor HOPKINS, Doctor CLARK, and Mr. O. F. CURTIS, JR.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. In both laboratory and recitations emphasis is placed on discussion of the principles taught and on their applications. Laboratory fee, $4; deposit, $3.

231. **Plant Physiology, Advanced Lecture Course.** Throughout the year. Credit three hours a term. Prerequisite, training in botany and chemistry, to be determined in each case by the department. Limited to seniors and graduate students. Lectures, M W F 10. Plant Science 143. Professors KNUDSON and O. F. CURTIS.

232. **Plant Physiology, Advanced Laboratory Course.** Throughout the year. Credit three hours a term. Prerequisite or parallel, course 231. Laboratory, M 1.40–4, S 8–12.30. Plant Science 241. Professors KNUDSON and O. F. CURTIS,

Assistant Professor HOPKINS, and Doctor CLARK. Laboratory fee each term, $10; breakage deposit, $5.

233. **Seminar in Plant Physiology.** Throughout the year. Required of graduate students taking work in the department. Conference, F 11. Plant Science Seminar Room. Professors KNUDSON and O. F. CURTIS, Assistant Professor HOPKINS, and Doctor CLARK.

The presentation and discussion of current contributions to plant physiology; reports on the research problems of graduate students and members of the staff.

[161. **History of Botany.** Second term, without credit.] Not given in 1938–39.

A course of lectures given by various members of the staff with the purpose of acquainting advanced students of botany with the historical development of their science.

171. **Special Problems in General Botany, Taxonomy, Morphology, Anatomy, Paleobotany, Economic Botany, Cytology, and Physiology.** Throughout the year. Credit not less than two hours a term. By appointment. Professors WIEGAND, KNUDSON, EAMES, L. W. SHARP, O. F. CURTIS, PETRY, and MUENSCHER, and Assistant Professor HOPKINS.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem. The laboratory fee depends on the nature of the work and on the number of credit hours.

DAIRY INDUSTRY

Students intending to specialize in Dairy Industry are urged to elect qualitative and quantitative analysis, organic chemistry, and general bacteriology, in order that these courses may be completed by the end of the first term of the junior year.

1. **Introductory Dairy Science.** First or second term. Credit three hours. Prerequisite, Chemistry 102 or 104. Lectures, T Th 11. Dairy Industry Building 218. Laboratory: first term, M or F 1.40–4.30 or S 9–12; second term, M or Th 1.40–4.30. Dairy Industry Building 209. Professor HERRINGTON and Messrs. HOLLAND and STEELE.

The scientific and practical aspects of milk and a survey of the dairy industry. Especial attention is given to the composition of milk and its physical and chemical properties, quantitative tests for fat and other constituents, and qualitative tests for preservatives and adulterants. Laboratory fee, $7.

5. **Technical Control of Dairy Products.** Second term. Credit one hour. Prerequisite, course 1. Lecture and laboratory practice, Th 1–6. Three sections of one-third term each. Dairy Industry Building 120. Professor HERRINGTON and

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The analysis of dairy products by factory methods. Laboratory fee, $5.

102. **Market Milk and Milk Inspection.** Second term. Credit five hours. Prerequisite, course 1, and Bacteriology 1 or its equivalent. Lecture and laboratory practice, M W 12–5 or T Th 1–6. Dairy Industry Building 218 and 146. Professors ROSS and BRUECKNER and Assistant Professors AYRES.

The scientific, technical, and sanitary aspects of the fluid-milk industry. Laboratory fee, $10.

103. **Milk-Products Manufacturing.** First term. Credit five hours. Prerequisite, course 1, and Bacteriology 1 or its equivalent. Lectures, recitations, and laboratory practice, T Th 10–3.30. Dairy Industry Building 120. Professor GUTHRIE and Assistant Professor AYRES.

The principles and practice of making butter, cheese, and casein, including a study of the physical, chemical, and biological factors involved. Consideration is given also to commercial operations and dairy-plant management. Laboratory fee, $10.

104. **Milk-Products Manufacturing.** Second term. Credit five hours. Prerequisite, course 1; should be preceded or accompanied by course 5. Lectures,

recitations, and laboratory practice, F 12–5, S 8–1. Dairy Industry Building 120. Assistant Professor AYRES.

The principles and practice of making condensed and evaporated milk, milk powders, ice cream, and by-products, including a study of the physical, chemical, and biological factors involved. Laboratory fee, $10.

108. **Commercial Grades of Dairy Products.** Second term. Credit one hour. Should be preceded by courses 103 and 104. Lectures, recitations, and laboratory practice, T 8–10 p.m. Professor GUTHRIE and Assistant Professor AYRES.

The classification of dairy products and the factors involved in grading them.

111. **Analytical Methods.** Second term. Credit four hours. Prerequisite, quantitative analysis. Lecture, T Th 10. Laboratory practice, T 1–5. Dairy Industry Building 120. Professor HERRINGTON and ————————.

An advanced course in the chemical analysis of products and materials important in the dairy and food industries. Laboratory fee, $10.

112. **Chemistry and Physics of Biological Materials.** First term. Credit three hours. Prerequisite, analytical and organic chemistry, and college physics. M W F 12. Dairy Industry Building 119. Assistant Professor HAND.

A fundamental treatment of the physico-chemical processes occurring in living cells and other biological materials.

113. **Dairy Chemistry.** First term. Credit two hours. Prerequisite, qualitative and quantitative analysis and organic chemistry; must be preceded or accompanied by course 112 or its equivalent. Lectures, M W 8. Dairy Industry Building 119. Professor P. F. SHARP.

A consideration of milk and dairy products from the physio-chemical point of view.

Dairy Bacteriology. (See Bacteriology 103.)

220. **Milk Products.** Second term. Credit four hours. Prerequisite, course 113. Lectures, M T W Th 8. Dairy Industry Building 120. Professor P. F. SHARP.

An advanced consideration of the scientific and technical aspects of milk products.

251. **Research.** First or second term. Credit one or more hours, by arrangement. For advanced students.

Special problems in any line of dairy work may be elected.

252. **Seminar.** Throughout the year. Without credit. Required of graduate students taking work in the department; open to undergraduate students taking advanced work. Hours to be arranged. Dairy Industry Building. Professor SHERMAN.

DRAWING

1. **Mechanical Drawing.** First or second term. Credit three hours. Lectures during laboratory periods. Laboratory: section 1, W F 1.40–4, or section 2, Th 1.40–4 and S 10.30–12.50. Two additional practice periods to be arranged to suit the schedule of the student. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

A course dealing with the principles and practices involved in the art of conveying information by graphical methods. The work includes use of instruments; lettering; orthographic projection involving plans, elevations, and sections; isometric drawing; and the practical applications of these principles to simple problems. This course may well be taken early by students interested in agricultural engineering. Laboratory fee, 50 cents.

2. **Mechanical Drawing.** First or second term. Credit three hours. Open only to students in hotel administration and required of them. Lectures during laboratory periods. Laboratory, T 1.40–4 and S 8–10.20. Additional practice periods to be arranged to suit the schedule of the student. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

Laboratory fee, 50 cents.

3. **Mechanical Drawing.** First or second term. Credit two hours (one hour for those who have taken course 1). Primarily for students of nursery landscape. Lectures during laboratory periods. Practice periods arranged to suit students' schedules. Laboratory, Th 1.40–4 and S 10–12. Dairy Industry Building, Fourth Floor. Students must apply at the time of registration regarding materials required. Assistant Professor REYNA.

This course embraces the elements of orthographic projection; isometric drawing and mechanical perspective. Laboratory fee, 50 cents.

5. **Mechanical Perspective Drawing.** First or second term. Credit two hours. Lectures during laboratory periods. Laboratory, T Th 11–12 and two two-hour practice periods by arrangement. Dairy Industry Building, Fourth Floor. Assistant Professor REYNA.

A course in perspective representation by mechanical methods, embracing all the fundamentals necessary for practical application to architectural or shop problems. Laboratory fee, 50 cents.

11. **Free-Hand Drawing.** First and second terms. Credit from two to four hours a term. One hour of credit means three hours of actual practice. Lectures during practice. Practice by appointment, daily 9–12.50 and 1.40–4, except F afternoon and S morning. East Roberts 371. Assistant Professor GARRETT and Mr. ————————.

An elementary course for the development of graphic expression applicable to scientific studies. Of special value to those who expect to enter the field of teaching, nature study, or biological research.

12. **Free-Hand Drawing, Advanced Course.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Lectures during practice. Practice same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

13. **Pen-and-Ink Drawing.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

14. **Water Color.** First and second terms. Credit from two to four hours. Prerequisite, four hours of course 11 or its equivalent. Practice, same as course 11. East Roberts 371. Assistant Professor GARRETT and Mr. ————.

15. **Free-Hand Perspective.** First or second term. Credit three hours a term. Prerequisite, course 1 and at least three hours of course 11. Lectures and criticisms, T Th 12. Drafting periods according to schedule of student. East Roberts 341. Assistant Professor GARRETT and Mr. ————.

A course in appearance drawing from data, with special emphasis on representation of tree forms and foliage; intended primarily for landscape-service students.

16. **Picture Study.** First or second term. Credit one hour a term. Open to sophomores, juniors, and seniors who have had at least two hours of Free-Hand Drawing. Registration limited to twelve students. Lectures, W F 12. East Roberts 341. Assistant Professor GARRETT.

ENTOMOLOGY

For related work, see the courses listed under the headings *Zoology* and *Wild-Life Conservation*, and, in the announcement of the College of Arts and Sciences, under the heading *Biology*.

BIOLOGY

1. **General Biology.** Throughout the year. Credit three hours a term. First term prerequisite to second. Not open to students who have had both Zoology 1 and Botany 1. If Biology 1 is taken after either Zoology 1 or Botany 1, credit two hours a term. Lectures and demonstrations, M W F 9 or 11. Roberts 392. One practice period a week. Roberts 301 and 302. Assistant Professor MOTTLEY, Doctor NEVIN, and assistants.

An elementary course intended to give a cultural background for students planning to major outside of the animal and plant sciences. The course deals with

the organization of representative types of plants and animals and takes up the principles of nutrition, growth, behavior, reproduction, heredity, and evolution. Laboratory fee, $3.50 a term.

5. **Laboratory Methods in Animal Biology.** Second term. Credit two hours. Prerequisite, Biology 1 or Zoology 1 and permission to register. Lecture and laboratory, F 10–12.30, and one period by appointment. Roberts 302. Doctor NEVIN and cooperating specialists.

For students who intend to teach or to follow some phase of zoology as a profession. This course includes such subjects as: laboratory equipment; collection, preservation, and storage of materials; sectional and non-sectional preparations of animal tissues for histological study; injection of blood vessels and embalming; preparation of bird and mammal skins for study; chart making; introduction to photography including the preparation of lantern slides. Laboratory fee, $5.

GENERAL ENTOMOLOGY

Courses 12, 15, 21, 30a, one term of 31, and 41 are required of all students who plan to take advanced work in entomology, and a reading knowledge of German and French is essential. To be considered a major student in entomology and therefore to be eligible for exemption from the farm-practice requirement, students must have taken the courses listed above, three hours of 30b or the equivalent, including assigned work in connection with which they should plan to devote the major portion of at least one summer to field work, and fifteen additional hours in entomology; they must further have maintained an average of at least 80 in the biological subjects of the freshman and sophomore years.

12. **General Entomology.** First term. Credit three hours. Prerequisite, Biology 1, Zoology 1, or Botany 1. Lectures, W F 9. Comstock 245. Professor MATHESON. Practical exercises, T W Th or F 1.40–4, or S 8–10.30. Comstock 200. Professor MATHESON and Messrs. ALBERT MILLER and HURLBUT.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, and their classification. The lectures only (two hours) may be taken by those who have had courses 15, 21, and 30a. Laboratory fee, $2.50.

15. **Wing Venation and Evolution.** First or second term. Credit one hour. Prerequisite, course 12. Required of all students who plan to take advanced work in entomology. Lecture, T 12, and two additional hours on T afternoon or T Th morning, by appointment. Comstock 300. Professor BRADLEY and Mr. PATE.

A laboratory study of evolutional series as illustrated by progressive modification of the wings of insects.

[16. **The Ecology of Insects.** First term. Credit three hours. Prerequisite, Biology 1 or Zoology 1, and Entomology 12. Professor PALM.] Not given in 1938–39.

A general study of insects in relation to their environment. Activities of insects; the rôle insects play in different natural associations; the relations between structure, instinct, habitat; ways of living. Laboratory fee, $2.50.

117. **Entomological Aspects of Biological Problems.** First term. Credit one hour. Open to upperclass and graduate students whose major interest is in Entomology. Lectures, M 10. Comstock 145. Doctor FORBES.

A review of the contributions of entomology to the study of certain more general biological problems, such as distribution, coloration, relation to environment, and the question of species. Some consideration is given also to the history of entomology and to museums, explorations, and other means that are used in its development.

118. **The Technics of Biological Literature.** First term. Credit three hours. Lectures, M F 11. Comstock 300. Library work by assignment. Professor BRADLEY.

A critical study of the biologists' works of reference. Practice in the use of generic and specific indices and of bibliographies, and in the preparation of the

latter; methods of preparing technical papers for publication; zoological nomenclature. This course is of a technical nature, and is intended to aid students specializing in zoology or entomology in their contact with literature.

Insect Morphology

21. **Elementary Morphology of Insects.** First or second term. Credit three hours. Required of all students who plan to take advanced work in entomology. Hours by appointment. Comstock 270. Doctor Butt.

This course deals with the external and the internal anatomy of several common species of insects. Laboratory fee, $2.50.

122a. **Insect Morphology: Anatomy and Histology.** First term. Credit two hours. Prerequisite, courses 21, and 12 or 30a. Lectures, assigned reading, and reports. T Th 10. Comstock 145. Doctor Butt.

122b. **Insect Morphology: Embryology and Post-embryonic Development.** Second term. Credit two hours. Prerequisite, courses 21, and 12 or 30a. Lectures, assigned reading, and reports. T Th 10. Comstock 145. Doctor Butt.

124a. **Insect Histology: Advanced Morphology and Histology.** First term. Credit two hours. Must be preceded or accompanied by course 122a. Two laboratory periods a week by appointment. Comstock 265. Doctor Butt.

Designed to accompany the lectures in course 122a. Studies are made of insect tissues and of typical microscopical preparations. Laboratory fee, $3.

124b. **Insect Histology: Technic.** Second term. Credit two hours. Must be preceded or accompanied by course 122a. Two laboratory periods a week by appointment. Comstock 265. Doctor Butt.

The technic of preparing, sectioning, and mounting insect tissues for study. A portion of the term is devoted to the study of embryological material. Laboratory fee, $3.

Insect Taxonomy

30a. **Elementary Taxonomy of Insects.** Second term. Credit one hour. Open to freshmen. Prerequisite, courses 15 and 21. Until the spring recess. Laboratory and field work, F 1.40–4 and S 10.30–12.50. Comstock 300. Professor Bradley and Mr. Pate.

Practice in determining the orders and families of insects. Laboratory fee, $2.25.

30b. **Elementary Taxonomy of Insects.** Second and first terms, beginning after spring recess. Credit one hour second term and one or two hours the following first term, credit given only on the completion of the course. Open to freshmen. Second term: laboratory and field work, F 1.40–4 and S 10.30–12.50. First term: by appointment. Comstock 310. Professor Bradley.

Methods of collecting insects and preserving them for study, and other matters of technic. Problems are assigned to be completed during the summer and fall and reported on during the fall term. Laboratory fee (spring term only), $2.25, and expense of trip, including one all-day trip.

31. **Taxonomy of Insects.** This course extends through three terms, but the work of any term may be taken independently. Credit three hours. Prerequisite, courses 21, 15, and 30 a. Lecture, W 10. Laboratory, T Th 1.40–4. Comstock 300. Professor Bradley and Mr. Pate.

A survey of the classification of the orders of insects. For the year 1938–39, the orders to be treated are: first term, Lepidoptera, Coleoptera; second term, Hymenoptera, Hemiptera. For the year 1939–40, the orders to be treated are: first term, Coleoptera, Lepidoptera; second term, Orthoptera, Diptera, and minor orders. Laboratory fee, $4.50 a term.

132. **Classification of Aquatic Insects.** First term. Credit two hours. Prerequisite, course 12. Laboratory, F 1.40–4 and one period Saturday morning. Comstock 300. Professor Bradley and Mr. Pate.

This course is intended primarily for students preparing to take limnology. Laboratory fee, $4.

Economic Entomology

41. **General Economic Entomology.** Second term. Credit three hours. Prerequisite, course 12. Lectures, W F 9. Comstock 145. Professor Readio. Practical exercises, W or F 1.40–4. Comstock 100. Mr. Middlekauff.

Lectures on the life histories and habits of injurious insects, and on the methods of control; practical exercises on the commoner pests and the more important insecticides, as time permits; several field excursions. Laboratory fee, $2.

241. **Advanced Economic Entomology.** First and second terms. Credit two hours a term. Open to qualified seniors and graduate students. Lectures and conferences, M 11 and W 2–4. Comstock 145. Professor Readio.

A course for the student intending to work in the field of economic entomology, including such subjects as: principles of insect control by natural agencies, biological control methods, inspection and quarantine regulations, cultural practices, physical methods, and use of insecticides; methods of planning and conducting experiments in insect control; insectary methods of rearing and studying insects; literature of economic entomology. The course is given cooperatively by the Division of Entomology of the New York State Agricultural Experiment Station at Geneva and the extension and research staffs of the Department of Entomology at Cornell University.

[43. **Insects Injurious to Trees and Shrubs.** Second term. Credit two hours. Prerequisite, course 12. Professor Readio.] Not given in 1938–39.

A consideration of the chief insects injurious to shade trees, to trees of the farm woodlot, and to ornamental shrubs. Methods of control are stressed. Laboratory fee, $1.50.

Parasitology and Medical Entomology

[51. **Parasites and Parasitism.** Second term. Credit two hours. Prerequisite Biology 1 or Zoology 1. Professor Matheson and Messrs. Albert Miller and Hurlbut.] Not given in 1938–39.

A consideration of the origin and biological significance of parasitism, and of the structure, life, and economic relations of representative parasites. Laboratory fee, $2.

52. **Medical Entomology.** Second term. Credit two hours. Prerequisite, Zoology 1 or Biology 1. Lecture, T 9. Comstock 245. Laboratory, T W or Th 1.40–4. Comstock 200. Professor Matheson and Messrs. Albert Miller and Hurlbut.

This course deals with insects and other arthropods that are the causative agents of disease in man and animals, or are the vectors, or intermediate hosts, of disease-producing organisms. Laboratory fee, $2.

Apiculture

Advanced and graduate students taking courses 122 and 124, and specializing in apiculture, are permitted to use the honeybee as illustrative material in the laboratory work of these courses.

61. **General Beekeeping.** Second term. Credit three hours. Lectures, T Th 11. Comstock 17. Practical exercises, W 1.40–4. Comstock 17. Professor Phillips.

This course is intended to afford a general knowledge of the fundamentals of beekeeping, including the life history, instincts, and general behavior of bees, their products, the sources of honey, the rôle of bees in cross-pollination, the equipment of the apiary, wintering problems, the diseases of bees, and the rearing of queens. Laboratory fee, $2.50.

261. **Advanced Beekeeping.** First and second terms. Credit four hours a term. Open only to qualified seniors and graduate students. M F 11–12.50. Comstock 17. Professor Phillips.

A technical course covering investigations, especially those of a scientific character, in all phases of apiculture. Special consideration is given to the study of beekeeping regions, with particular reference to conditions in New York.

Designed for advanced students preparing to teach or to do research in apiculture.

Limnology and Fisheries

The courses offered in this division require a certain background in other subjects. Undergraduate students intending to major in the division should plan their studies from the first year with the following sequence of courses. First year, Zoology 1; second year, Botany 1, Zoology 8 and 16, and Entomology 12; third year, Entomology 132, 171, 73, and 74. Students are also urged to obtain a foundation in Statistics. Zoology 22 is recommended before graduation.

171. **Limnology.** Second term. Credit three hours. Prerequisite, courses 12 and 132, Botany 1, and Zoology 1, 8, and 16. Lecture, Th 11. Comstock 145. Laboratory, F 1.40–4, S one period by appointment. Comstock 110. Assistant Professor Mottley.

An introduction to the study of the relations between aquatic organisms and their environment. A laboratory and field course. Laboratory fee, $5.

172. **Advanced Limnology.** First term. Credit three hours. Prerequisite, course 171. Lecture, Th 11. Comstock 145. Laboratory, F 1.40–4, S one period by appointment. Comstock 110. Assistant Professor Mottley.

A qualitative and quantitative treatment of the problem of the productivity of inland waters. Laboratory fee, $7.50.

73. **Aquiculture.** First term. Credit three hours. Prerequisite, Biology 1 or Zoology 1. Lectures, M W F 12. Comstock 145. Professor Embody.

An exposition of the basic principles and cultural methods for propagating useful aquatic organisms, with special reference to fishes. The lectures cover such subjects as migration, spawning habits, natural and artificial foods, growth, assessment of age; cultural procedure for trout, bass, and other American fishes; European carp culture; commercial propagation of goldfish; and financial aspects of fish culture.

74. **Fish Culture.** Second term. Credit two hours. Must be preceded by course 73. T Th 1.40–4. Fish Hatchery and Comstock 110. Professor Embody.

A laboratory and field course, designed to give practice in hatchery methods, pond management, the study of natural conditions suitable for the maintenance of fish life, the evaluation of streams and lakes, and stocking procedure. An all-day excursion to one of the state fish hatcheries is required. The expense for this trip should not exceed $10. Laboratory fee, $7.

75. **Fisheries Management.** Second term. Credit one hour. Lecture, W 12. Comstock 145. Professor Embody and cooperating specialists.

A course dealing with the management of streams and lakes from the angler's point of view. The lectures will treat of such subjects as physical, chemical, biological, and other factors influencing the production of food and game fishes, surveys, stream and lake-improvement methods, restocking, fishways, regulatory laws, and the establishment and functions of Conservation Departments.

Insect Physiology

281. **Insect Physiology.** First term. Credit three hours. Prerequisite, courses 122a and 122b, and permission to register. Lectures, discussions, and demonstrations, M Th 1.40–4. Comstock 17. Cooperating members of the staff.

For seniors and graduate students intending to work in entomology as a profession. The functions of the more important organs of various insects are discussed, together with the mechanisms by means of which these functions are coordinated. Experimental methods are discussed and demonstrated. Fee, $5.

Research

300. **Research.** Throughout the year. Credit and laboratory fees to be arranged. Prerequisite, permission to register from the professor under whom the work is to be taken. Comstock.

300b. **Insect Morphology.** Doctor BUTT.

300c. **Taxonomy.** Professor BRADLEY and Doctor FORBES.

300d. **Economic Entomology.** Professors MATHESON, READIO, MACLEOD, and PALM and Assistant Professor BLAUVELT.

300e. **Medical Entomology and Parasitology.** Professor MATHESON.

300f. **Apiculture.** Professor PHILLIPS.

300g. **Aquiculture.** Professor EMBODY and Assistant Professor MOTTLEY.

300h. **Limnology.** Professor EMBODY and Assistant Professor MOTTLEY.

300i. **Insect Physiology.** Professors PHILLIPS and MACLEOD and Assistant Professor COLLINS.

SEMINARS

Jugatae. Throughout the year. M 4.30–5.30. Comstock 145.

The work of an entomological seminar is conducted by the Jugatae, an entomological club that meets for a discussion of the results of investigations by its members.

Seminar in Insect Physiology. Second term. Hours to be arranged. Comstock. Open to qualified students. Professor MACLEOD.

EXTENSION TEACHING

101. **Oral and Written Expression.** First or second term. Credit two hours. Open to juniors and seniors. The number in each section is limited to twenty-four students. Students should consult Professor PEABODY for assignment to sections. Lectures and practice: first term, M F 11, W F 10, or T Th 11, Roberts 131, M W 9, T Th 9, T Th 10, Roberts 492; second term, M W 9, T Th 9, Roberts 492; T Th 11, Roberts 131. Criticism, by appointment, daily, 8–1. Professors EVERETT and PEABODY and Messrs. PHILLIPS, GOODRICH, and BARNUM.

Practice in oral and written presentation of topics in agriculture, with criticism and individual appointments on the technic of public speech. Designed to encourage interest in public affairs, and, through demonstrations and the use of graphic material and other forms, to train for effective self-expression in public. Special training is given to competitors for the Eastman Prizes for Public Speaking and the Farm Life Challenge contest. (See page 78.)

102. **Oral and Written Expression.** Second term. Credit two hours. Prerequisite, course 101, of which course 102 is a continuation. A part of the work of course 102 consists of a study of parliamentary practice. Lectures and practice, W F 10, T Th 9, T Th 10, or M F 11. Roberts 131. Criticism, by appointment, daily 8–1. Professors EVERETT and PEABODY and Messrs. PHILLIPS, GOODRICH, and BARNUM.

103. **Extension Organization, Administration, and Policy.** Second term. Credit three hours. Open to graduate students and seniors, and to juniors by special arrangement. Lectures and exercises based on field work. M W F 10. Roberts 492. A limited number of practice periods on program building may be required outside of the regular class periods. Professors SIMONS, WRIGHT, FLANSBURGH, and KELSEY, and other members of the Extension Staff.

This course is designed to familiarize students with the organization, administration, and policies of extension work as exemplified in New York State. The course is for students preparing for effective service as citizens in rural communities, as well as for prospective county agricultural agents, county 4-H Club agents, home-demonstration agents, or other extension workers in agriculture and home economics.

104. **Advanced Oral Expression.** Second term. Credit two hours. Prerequisite, courses 101 and 102. Not given unless four or more register. M W 12. Roberts 492. Professor PEABODY.

An advanced course of study and practice in oral expression as directly related to the needs of the county agent, the home demonstration agent, the junior club leader, and the extension specialist. Part of the work consists in a study of and practice in radio speaking.

110. **Agricultural Radio Broadcasting.** Second term. Credit two hours. Prerequisite, course 101, or its equivalent. Lecture, W 10. Practice, Th 2–4. WESG Studio. Professor TAYLOR and Mr. PHILLIPS.

A course to familiarize students with the best methods of presenting ideas by radio and with radio-studio procedure. Practice includes auditions and criticisms for all members of the class in preparing and presenting radio talks; continuity writing and program arrangement. Participation in broadcast programs from the University station is required. Fee for materials furnished, $1.

15. **Agricultural Journalism.** First term. Credit three hours. Open only to those who have passed the required hours in English with an average grade of 80 or better. T Th S 10. Roberts 392. Professor ADAMS.

This course gives the principles of news writing as applied to agricultural and home-economics subjects.

117. **Agricultural News Writing.** First and second terms. Credit two hours a term. Prerequisite, course 15. Th 2–4. Roberts 492. Professor ADAMS.

This course deals with practical news writing for publication. It includes criticisms, discussions, and consultations on published material written by students in the course.

119. **The Country Newspaper.** First term. Credit two hours. Prerequisite, course 15. M W 10. Roberts 492. Professor ADAMS.

A study of the community newspaper, its problems, its make-up, and its place as an influence in rural life.

120. **Agricultural Information.** Second term. Credit two hours. Prerequisite, course 15. T Th 11. Roberts 392. Professor ADAMS.

Publicity and advertising in agricultural extension.

122. **Special Feature Articles.** Second term. Credit two hours. Prerequisite, course 15. M W 11. Roberts 492. Professor ADAMS.

FARM PRACTICE

The farm-practice requirement is forty points, all of which must be obtained by actual farm work. (See page 18.)

The Office of Farm Practice will assist students in getting work on farms during vacations and at other times, and will supervise and keep records of the work. Students should consult the office in regard to work on farms.

The office will also be glad to assist those students who have completed the farm-practice requirement, in obtaining places on farms where they can gain wider experience.

1. **Farm Practice.** First and second terms. Without credit toward graduation, but giving credit toward the farm-practice requirement, depending on the amount and the quality of the work done. Hour and place, by appointment. Professor KING and assistants.

A course designed to assist those students who enter with little or no farm experience. Students will have an opportunity to hitch, harness, and drive horses and to familiarize themselves with the use of the common farm tools. Admission to this course will be determined by the results of the farm-practice tests. This course should be taken by all new students who have had limited farm experience.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

Instruction in floriculture is planned for the following classes of students: (1) those who intend to make some branch of commercial flower-growing their life work; (2) those who plan to enter a retail business in floriculture; (3) those who are interested in amateur flower-growing for pleasure and home decoration; (4) those who plan to take up some line of work on private estates or in city parks.

Instruction in ornamental horticulture is planned primarily to fit students for nursery management and for nursery landscape service. The former deals with the propagation, growing, and selling of ornamental plants, while the latter deals with the proper planning and planting of small properties. Training is included

for park superintendents, for the management of private estates and for work such as is done by planting superintendents for landscape architects. Instruction in the construction and management of lawns and golf courses is also given.

Distinct from the above is the course for those who are interested in landscape architecture as a profession, organized in the College of Architecture. This is a five-year course dealing with the design of out-of-door spaces for human use and enjoyment, emphasizing design, mathematics, and construction, and including also much work with plants and in planting design.

All students specializing in floriculture or ornamental horticulture must take one spring and summer, or its equivalent, in actual practice in the field or in greenhouses.

Note: Courses 1 and 10 are required in the freshman year for students specializing in the department.

Floriculture

1. **Principles and Methods of the Propagation and Management of Greenhouse Crops.** First term. Credit three hours. Prerequisite to courses 3, 101, 102, and 104. Lectures, M W 10. Plant Science 37. Practice, T or Th 1.40–4. Plant Science 15 and greenhouses. Professor White, Assistant Professor Post, and Mr. Allen.

An elementary course in commercial flower growing, intended to acquaint students with the scientific principles and floricultural methods governing the propagation and culture of flowering plants under glass. The construction, heating, and equipment of greenhouses also are studied. Laboratory fee, $4; deposit, $2.

2. **Amateur Floriculture.** Second term. Credit three hours. Cannot be taken for credit by those who have had course 1. Registration limited to fifteen students. Lectures, M W 11. Plant Science 37. Practice, M 1.40–4. Plant Science 15 and greenhouses. Miss Smith.

An elementary course designed especially for those not specializing in floriculture who wish a practical knowledge of the culture and use of plants indoors and in the amateur garden.

101. **Commercial Floriculture.** First and second terms. Credit four hours a term. Prerequisite, courses 1 and 7, Botany 31, Agronomy 1, and the practice requirement. Lectures and recitations, M W F 9. Plant Science 22. Practice, W 1.40–4. Greenhouses. Assistant Professor Post.

The first term consists of a comprehensive study of the principles underlying the culture of greenhouse plants. The second term is devoted to a study of the culture of greenhouse crops such as are grown by florists for commercial purposes. Special attention is given to methods of culture, timing the crop, packing, shipping, and to the cost of production. The class is required to participate in a fall and a spring trip to near-by commercial greenhouses. Laboratory fee, $3 a term.

103. **Wholesaling and Retailing Flowers.** Second term. Credit two hours. Prerequisite, courses 101 and 105, and permission to register. Lecture, M 11. Practice, M 1.40–4. Plant Science 22. Mr. Keyes.

This course is planned with the view of giving students a thorough knowledge of methods of retail-store management, store equipment, salesmanship, business methods, delivery, decorating for all functions, flower arrangement and the making of designs, methods of conducting cooperative flower exchanges, the wholesale markets. A required trip to Rochester to visit wholesale establishments and retail stores, is made about May 1. Laboratory fee, $7.

105. **Flower Arrangement.** Second term. Credit one hour. Registration limited to fifteen students in each section. Preference for registration in Section 1 is given to students specializing in floriculture or in agriculture. Section 2 is for home-economics students. Lectures, demonstrations, and practices: section 1, T 1.40–4; section 2, Th 2–4.20. Plant Science 22. Miss Smith.

A study of the principles and methods of arranging flowers and plants for decorative use in the home and for public functions. Laboratory fee, $5.

Plant Materials

3a. **Herbaceous Plant Materials.** Second term. Credit two hours. Prerequisite, course 1 or permission to register. Lecture, T 8. Plant Science 37. Practice, T or Th 1.40–4. Plant Science 15 and gardens. Messrs. Allen and Peigelbeck.

A study of the ornamental herbaceous plants used in landscape and garden plantings. Emphasis is placed on the identification and uses of spring and early-summer flowering perennials. All members of the class are required to participate in an excursion to Rochester parks and gardens. Laboratory fee, $4.

3b. **Herbaceous Plant Materials.** First term. Credit one hour. Prerequisite, course 3a. Practice, W 10–12 or F 11–1. Plant Science 15 and gardens. Messrs. Allen and Peigelbeck.

A continuation of course 3a dealing with annuals and late summer and fall-flowering perennials. Principles of the arrangement of herbaceous plants are studied. Laboratory fee, $2.

8. **Woody-Plant Materials.** First and second terms. Summer school is required in ornamental horticulture. Credit two or four hours a term. Lectures, T Th 9. Plant Science 37. Laboratory and field trips, M and W or F 1.40–4. Plant Science 29. Professor R. W. Curtis and Doctor Pridham.

A study of the trees, shrubs, and vines used in landscape planting and in nursery work. All members of the class are required to participate in two excursions to the Rochester parks and gardens, one in the spring and one in the fall. Laboratory fee, $4 a term.

104. **Conservatory Plants.** First term. Credit two hours. Given in alternate years. Prerequisite, courses 1 and 101, and Botany 1. Lecture, W 11. Plant Science 37. Laboratory, F 1.40–4. Plant Science 15. Mr. Keyes.

Designed for students interested in work on private estates or in parks. A study of such tropical and subtropical foliage and flowering plants as are used for the ornamentation of glasshouses of decorative type. Laboratory fee, $3.

112. **Lawn-making and Green-keeping.** Second term. Credit two hours. Prerequisite, course 8, Agronomy 1, and permission to register. S 8–1. Plant Science 29. Professor R. W. Curtis.

This course deals with the principles, practices, and materials which have to do with the construction and maintenance of lawns and greens. It is a survey course, and includes a term report assigned to each student. Two inspection trips are taken late in the spring, first to the Arlington Turf Garden near Washington, D. C., and to golf courses at Philadelphia, Pennsylvania, and Utica, New York.

Plant Propagation and Nursery Management

7. **Plant Propagation.** First term. Credit three hours. Prerequisite, course 1, Botany 1, or departmental permission in special cases. Lectures, T Th 11. Practice, S 8–10.30 or 10.30–12.50. Plant Science 40, greenhouses, and nurseries. Mr. Skinner.

This course is planned for both the general students and those specializing in floriculture and ornamental horticulture. It consists of a study of the elementary methods of plant propagation, and the care of the plant stocks produced. All members of the class are required to participate in an excursion to nurseries in Newark or vicinity early in November. Laboratory and excursion fee, $5.

109. **Commercial Practices in Woody-Plant Propagation.** Second and first terms. Credit two hours. Prerequisite, course 7 and Chemistry 102 or 104; to be accompanied or preceded by Plant Physiology 31. Lectures and laboratory: M W 11–12.50. Plant Science 40, greenhouses, and nurseries. Assistant Professor Hunn and Mr. Skinner.

A study of commercial-propagation problems and the use of greenhouses, frames, and seedbeds. The course further emphasizes the care of woody-plant stocks in the lining-out nursery and as a sales enterprise. Students are required to participate in an excursion to Newark, New York, in November, and in an Easter trip to Long Island and New Jersey nurseries. Laboratory fee, $5.

111. **Principles and Methods of Nursery Practice.** First and second terms. Credit two hours. Prerequisite, course 109 and Agronomy 1. Must be preceded or accompanied by Farm Management 102. Lectures and laboratory, T Th 1.40–4. Plant Science 40. Assistant Professor HUNN.

A course designed to meet the needs of students who intend to specialize in the commercial growing of ornamental nursery plants. It takes up nursery lands, the cultural care of nursery plants, and the practices employed in placing his material in the hands of the consumer. Special consideration is given to the economics of the industry, the sales, nursery organizations, and the relation of the nursery business to landscaping enterprises.

Several trips of a day's duration are made to nurseries in western New York in the fall term. A trip to the annual winter meeting of the New York State Nurserymen's Association at Rochester, and an extended trip to the vicinity of Philadelphia, Pennsylvania, or to Painesville, Ohio, during the Easter vacation, are made. Laboratory fee, $1.50.

171. **Tree and Shrub Management.** Second term. Credit two hours. Prerequisite, permission to register. Lecture, Th 11. Laboratory, W 1.40–4. Plant Science 40 and nurseries. Assistant Professor HUNN and members of the staff.

A study of the principles and practices employed in the transplanting and care of trees and shrubs including fertilizing, pruning, spraying, and big-tree moving. Laboratory fee, $1.50.

NURSERY LANDSCAPE SERVICE

10. **A Brief Introduction to Landscape Design and Ornamental Horticulture.** Second term. Credit three hours. Open to general election and required of students specializing in ornamental horticulture. Lectures, M W F 9. Plant Science 233. Acting Professor PORTER and members of the staff.

A discussion of the first principles of ornamental horticulture and landscape improvement as related to the problems of the small-residence property.

113. **Landscape Work on Small Properties.** First term. Credit three hours. Intended for advanced students; not open to general election. Prerequisite, courses 3, 8, and 10 and Drawing 1 and 11. Lecture, T 10. Plant Science 141. Laboratory, T 1.40–4 and F 10–12.50. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A study of the arrangement of small properties. Laboratory fee, $2.50.

114. **Landscape Work on Small Properties, Advanced Course.** Second term. Credit six hours. Prerequisite, course 113 and Agricultural Engineering 121. Criticisms, M F 10–1, W 9–12, W F 1.40–4.30 and three three-hour periods. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A continuation of course 113. Laboratory fee, $3.

115. **Planting Design.** First term. Credit four hours. Prerequisite, courses 3, 8, and 10 and Drawing 1 and 11. Lecture, W 9. Plant Science 141. Laboratory, M S 10–12.50 and W 1.40–4. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A study of the nature and characteristics of woody-plant materials in their relation to planting arrangements. The grouping of plants to produce serviceable as well as beautiful designs and compositions. A study of form, color, texture, and habit. Laboratory fee, $2.

116. **Planting Design, Advanced Course.** Second term. Credit three hours. Prerequisite, course 115 and Drawing 15. Lecture, Th 9. Laboratory, T 1.40–4, Th 10–12. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A continuation of course 115. Laboratory fee, $2.

117. **The Construction and Planting of Small Gardens.** First term. Credit three hours. Intended for advanced students in ornamental horticulture. Prerequisite, courses 113 and 115. Lecture, Th 9. Plant Science 141. Laboratory, Th 10–12.50 and 1.40–4. Plant Science 433. Acting Professor PORTER and Mr. REICH.

A study of the design, construction, and planting of intimate garden areas, with special attention to plant and flower combinations. Laboratory fee, $3.

Special Problems

162. **Special Problems in Floriculture and Ornamental Horticulture.** First or second term. Credit to be arranged. Designed for upperclassmen and graduate students. Prerequisite, permission to register. Consultation by appointment with staff members.

The investigation of problems in materials for ornamental planting, and in the commercial culture of cut flowers and potted plants, exotics, garden flowers, nursery work, and the like.

201. **Seminar.** First term. Required of all graduate students in the department. Th 4.15. Plant Science Seminar Room.

FORESTRY

Instruction in forestry is designed to meet the needs of the following: (1) students of general agriculture who wish elementary instruction in the care of woodlands and in forest planting and forest nursery work; (2) students interested in wild-life conservation and management; (3) students preparing for the fields of agricultural extension or vocational agricultural teaching; and (4) others who desire an understanding of the field of forestry in relation to public and private welfare.

1. **The Farm Woodlot.** First term. Credit three hours. Lectures, W F 11. Fernow 122. Practice, M 1.40–4. Fernow 206. Professor Recknagel.

A course covering those phases of forestry that are applicable to the farm woodlot. Identification of the principal trees of this region; measurement of logs, trees, and stands; nursery work, forest planting, thinning, and improvement cuttings; the preservative treatment of farm timbers. Laboratory fee, $1.

2. **The Utilization of Farm Woodlot Products.** Second term. Credit two hours. Lectures, T Th 9. Fernow 122. Professor Recknagel.

The principal products derived from farm woodlots, such as logs, pulpwood, firewood, fence posts, and so on, their harvesting and marketing, and the application of forest utilization practice to the farm woodlot. Identification of the wood of common trees, its properties and uses. Laboratory fee, $2 to cover the cost of two or three required field trips after the spring recess.

3. **Conservation of Natural Resources.** Second term. Credit two hours. Prerequisite, Economics 1. Lectures, T Th 10. Fernow 122. Professor Adams.

The conservation of natural resources in the United States; the interrelation of the uses and wastes of the forest with those of various resources; the influence of the physical equipment of America on human life and on American civilization, with special reference to natural resources, as the basis of national strength.

4. **The Field of Forestry.** First term. Credit two hours. Lectures, M W 10. Fernow 122. Professor Hosmer.

The place of forestry in the life of a nation; its nature, aims, and economic importance; the five main branches of forestry; national, state, communal, and private forestry, including a discussion of forest taxation.

23. **The Establishment and Development of Farm Woodlands.** Second term. Credit three hours. Lectures, M W 9. Fernow 122. Laboratory, T 1.40–4. Fernow 206. Professor Recknagel.

Distribution and importance of the principal timber trees and forest types of the United States; life history of the forest; silvicultural handling of woodlands including natural reproduction of forests; forest planting, seeding, and nursery work; care of the forest during its development, thinnings, and other intermediate cuttings; protection from fire and other enemies. Laboratory fee, $1.

54. **The Mensuration and Management of Farm Woodlands.** First term. Credit three hours. Lectures, T Th 9. Fernow 122. Laboratory, F 1.40–4. Fernow 206. Professor Recknagel.

Instruments used in forestry; measurement of logs, trees, and stands of timber; volume increment; value determination; methods of determining cutting budgets; woodlot-management plans. Laboratory fee, $1.

166. **Wild-Life Conservation in Relation to Forestry.** First term. Credit two hours. Prerequisite, Wild-Life Conservation and Game Management 2. Lectures, T F 10. Fernow 122. Professor HOSMER.

A consideration of the place of wild-life conservation and management in the multiple-purpose programs which govern the full and rounded use of national, state, and private forests.

291. **Seminar.** First and second terms. Without credit. Hours to be arranged. Professors HOSMER and RECKNAGEL, and Assistant Professor WALLIHAN.

Field and classroom conferences.

METEOROLOGY

1. **Elementary Meteorology.** First or second term. Credit three hours. Lectures, T Th 11. Plant Science 143. Laboratory, T W Th or F 1.40–4 or S 8–10.20. Plant Science 114. Professor MORDOFF and Mr. GRAVES.

A course designed to acquaint the student with the principles of the general and secondary circulation of the atmosphere; the elements of weather and climate; practical weather forecasting from weather maps and local observations. Laboratory fee, $2.

2. **General Climatology.** Second term. Credit two hours. Prerequisite, course 1. Lectures and recitations, M W 9. Plant Science 114. One conference period a week, by appointment. Professor MORDOFF.

A course designed to give a general knowledge of climatology and of the various climates of the United States, with emphasis on those of New York State.

211. **Research.** First or second term. Credit one or more hours a term. Prerequisite, permission to register. Hours by appointment. Professor MORDOFF.

A course designed for advanced and graduate students. Original investigations in meteorology and climatology.

212. **Seminar.** First term. Credit two hours. Prerequisite, course 2 and permission to register. Hours to be arranged. Plant Science 114. Professor MORDOFF.

Preparation and reading of reports on special topics; abstracts and discussions of papers dealing with the current literature of meteorology and climatology. A specific problem is required of each student.

PLANT BREEDING

101. **Genetics.** First term. Credit four hours. Prerequisite, a beginning biological science and a course in physiology. Courses in cytology and in taxonomic botany and zoology will be found helpful. Not open to sophomores. Lectures, M W F 8. Plant Science 233. One conference period, to be arranged. Laboratory, M T W or F 1.40–4. Plant Science 146. Professor FRASER and Doctor DORSEY.

A course designed to acquaint the student with the fundamental principles of heredity and variation in plants and animals.

Laboratory studies of hybrid material in plants and breeding experiments with the vinegar fly, Drosophila. Laboratory fee, $3; deposit, $2.

201. **Genetics, Advanced Course.** Second term. Credit three hours. Seniors admitted by special permission. Discussions, M F 8–10, and laboratory work to be arranged. Plant Science 146. Professor FRASER.

Laboratory fee, $3; deposit, $2.

103. **Plant Breeding.** Second term. Credit three hours. (Students who have had course 101 will be allowed two-hours credit.) Prerequisite, Botany 1, 31, and a general course in at least one of the following: farm crops, vegetable crops, floriculture, or pomology. Lectures, T Th 8. Lecture and practice, S 8–10. Plant Science 141. Professor C. H. MYERS.

A general study of the principles and practices of plant breeding, hybridization, selection, seed production and distribution in relation to crop improvement; development of methods for different types of plants; lectures supplemented by periods in the greenhouse and experimental fields.

150. **Special Problems in Plant Breeding and Genetics.** First or second term. Credit one or two hours. Open to properly qualified seniors. Prerequisite, Plant Breeding 101 or 103 and permission to register. Members of the Plant Breeding staff.

211. **Statistical Methods of Analysis.** First or second term. Credit two hours. For graduate students. Seniors admitted by special permission. Th 1.40–4. Plant Science. Assistant Professor LIVERMORE.

A discussion of statistical methods for the study of variation, correlation, curve fitting, experimental error, the analysis of variance and of covariance; and the application of these methods to problems in biology and related fields. Laboratory fee, $2.

222. **Seminar.** Second term. For graduate students only. W 11. Plant Science. Professors EMERSON, LOVE, MYERS, BUSSELL, FRASER, and WIGGANS, Assistant Professor LIVERMORE, and Doctor DORSEY.

PLANT PATHOLOGY

1. **General Plant Pathology.** First or second term. Credit three hours. Prerequisite, Botany 1 or its equivalent. Registration limited to sixty-six in the first term and to forty-eight in the second term. Admission on basis of average standing to date. Lecture, W 8. Plant Science 336. Practice and conferences, any two periods, T W Th F 1.40–4. Plant Science 336, 341, 343, and 362. Professor WHETZEL, Assistant Professor WELCH, and Messrs. SPROSTON, H. F. FITZPATRICK, CHANDLER, and WATSON.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the commoner diseases of cultivated crops. Laboratory fee, $4.50; breakage deposit, $3.

201. **Advanced Plant Pathology.** First and second terms. Credit three hours. Prerequisite, courses 1 and 2 and permission to register. Lecture, F 9. Plant Science 336. Practice, T F 10–12.30. Plant Science 304. Professor MASSEY and Doctor LONGRÉE.

A presentation and analysis of the experimental and empirical knowledge of plant diseases. The phenomena of infection, susceptibility, suscept reactions, and symptomatology are critically considered. Laboratory fee, $4.50; breakage deposit, $3.

2. **Principles of Plant-Disease Control.** First term, graduates; second term, undergraduates. (Not given in second term 1938–39.) Credit three hours. Prerequisite, course 1. Lecture, Th 8. Plant Science 336. Practice, M Th 1.40–4. Professor WHETZEL.

A consideration of the principles and methods of controlling plant diseases. This includes studies on: exclusion by laws, regulations, quarantine, inspection, and disinfection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, wound dressing, and the like; immunization by selection, breeding, and feeding. Number taking the course limited to twenty-four. Admission, if registration is in excess of this number, on the basis of average scholastic standing to date. Laboratory fee, $4.50; breakage deposit, $3.

111. **Forest and Shade-Tree Pathology, and Tree Surgery.** Second term. Credit two hours. Prerequisite, course 1. Lecture, T 9. Plant Science 336. Practice, M 10–12.30. Plant Science 362. Assistant Professor WELCH and Mr. CHANDLER.

A course designed especially for students in conservation, forestry, and ornamental horticulture, dealing with the recognition and control of diseases of forest, shade, and ornamental trees and shrubs, and the principles of tree repair. Laboratory fee, $2.50; breakage deposit, $3.

[121. **Comparative Morphology of Fungi.** First term. Credit four hours. Given in alternate years. An equivalent course (A4) is given in the summer school. Prerequisite, Botany 1 or its equivalent, and permission to register. Professor H. M. FITZPATRICK and Mr. WHITE.] Not given in 1938–39.

A synoptical course designed to introduce the beginner to the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy. Laboratory fee, $6; breakage deposit, $3.

221. **Mycology.** First and second terms. Credit four hours. Alternates with course 222. Prerequisite, Botany 1 or its equivalent, and permission to register. Lectures, M W 11. Plant Science 336. Practice, T Th 1.40–4. Plant Science 329. Professor H. M. FITZPATRICK and Mr. WHITE.

An intensive course designed especially for students specializing in mycology or plant pathology. A detailed treatment of the Phycomycetes and Ascomycetes. Here and in course 222 abundant opportunity for field work is given, and extensive practice in the culture and determination of fungi in many groups is gained. Laboratory fee, $6; breakage deposit, $3.

[222. **Mycology.** First and second terms. Credit four hours. Alternates with course 221. Prerequisite, Botany 1 or its equivalent, and permission to register. Need not be preceded by course 221. Professor H. M. FITZPATRICK and Mr. WHITE.] Not given in 1938–39.

An intensive course designed especially for students specializing in mycology or in mycological aspects of plant pathology. A detailed treatment of the Basidiomycetes and Fungi Imperfecti. Laboratory fee, $6; breakage deposit, $3.

[231. **History of Plant Pathology.** First and second terms. Credit one hour. Prerequisite, course 1 and a reading knowledge of French and German. Professor WHETZEL.] Not given in 1938–39.

241. **Undergraduate Research.** First or second term, or both. Credit three hours or more. Registration by permission. Not less than three laboratory periods of three clock hours each week. Professors and assistant professors of the departmental staff.

This course is designed to afford opportunity for selected undergraduates to test their inclination and ability to do research work. The student is expected to prosecute with interest and enthusiasm, under informal direction of the professor, some problem or problems mutually agreed upon. Laboratory fee, $1.50 a credit hour; breakage deposit, $3.

242. **Seminar.** First and second terms. Required of graduate students taking work in the department. T 4.30–6. Plant Science Seminar Room.

243. **Literature Review.** Optional. Biweekly. Time to be arranged.

POMOLOGY

Students desiring to do their major work in pomology may obtain a suggested sequence of courses for the four-year period by consulting the Department.

1. **General Pomology.** First or second term. Credit three hours. Lectures, T Th 8. Plant Science 233. Laboratory: first term, W Th or F 1.40–4; second term, M T W Th or F 1.40–4. Plant Science 107. Professor HEINICKE, Assistant Professor SMOCK or BOYNTON, and Messrs. SAVAGE, VAN DOREN, and LOUSTALOT.

A study of the general principles and practices in pomology; propagation and care of orchard trees and small fruits; harvesting, storing, and marketing fruit; practical work in budding, grafting, pruning, and planting; study of varieties, growth, and fruiting habits. Laboratory fee, $1.50.

2. **Fruit Varieties.** First term. Credit two hours. Prerequisite, course 1. Lecture, T 8. Laboratory, T 9 Th 8–10 or T 1.40–4. Plant Science 107. Professor MACDANIELS and Mr. SAVAGE.

A study of the most important varieties of apples, pears, peaches, plums, grapes, and small fruits from the standpoint of their identification, growth characters, regional adaptation, season of ripening, storage quality, and other matters of a similar nature. A part of the time is given to the judging of exhibition fruit, and the Farm and Home Week fruit exhibit is set up by the students in this course.

Laboratory fee, $1.50.

111. **Packing and Storage of Fruit for Market.** First term. Credit two hours. Prerequisite, courses 1 and 2. Lecture, S 8. Laboratory, S 9–11.30 or M 1.40–4.

Plant Science 107 and the packing house. Assistant Professor SMOCK and Mr. VAN DOREN.

The important factors in harvesting and handling fruit that affect quality and marketability are studied. Particular emphasis is placed on the practices and problems of handling apples, but the work covers also such fruits as peaches, pears, and grapes, in so far as these are available. The effect of grades and packages on distribution and marketing is fully discussed, and consideration is given to some of the problems of market inspection. The principles and practices of common, cold, and freezing storage are considered.

Laboratory fee, $1.50.

112. **Advanced Laboratory Course.** Second term. Credit two hours. Intended for students doing their major work in pomology. S 8–1. Plant Science 107. Professors HEINICKE and MACDANIELS.

This course is designed to give more extended practice in the various orchard operations than can be given in course 1. Special attention is given to problems of pruning, tree surgery, bracing, orchard-soil selection and management, and spray practice.

[121. **Economic Fruits of the World.** First term. Credit three hours. Given in alternate years. Prerequisite, course 1. Professor MACDANIELS and Mr. ———— ————.] Not given in 1938–39.

A study of all species of fruit-bearing plants of economic importance, such as the date, the banana, the citrus fruits, the nut-bearing trees, and the newly introduced fruits, with special reference to their cultural requirements in the United States and its insular possessions. All fruits not considered in other courses are considered here. The course is designed to give a broad view of world pomology and its relationship with the fruit industry of New York State. Laboratory fee, $1.50.

131. **Advanced Pomology.** Second term. Credit four hours. Prerequisite, courses 1 and 2, and Botany 31. Discussions, M W F 8. Plant Science 141. One conference period, to be arranged. Professor HEINICKE.

A comprehensive study of the sources of knowledge and opinion as to practices in pomology; methods and results of experimental work in pomology are discussed with special reference to their application in the solution of practical problems in fruit growing.

[231. **Special Topics in Experimental Pomology.** First term. Credit three hours. Given in alternate years. Open to qualified seniors and to graduate students. Professor HEINICKE.] Not given in 1938–39.

In this course the student is expected to review critically and evaluate the more important original papers relating to various phases of pomological research. Interpretation of the literature is made on the basis of the fundamental principles of plant biology. Recent experimental methods applicable to the field of pomology are fully considered.

243. **The Functional Morphology and Anatomy of Fruit Plants and Their Products.** First term. Credit three hours. Given in alternate years. Prerequisite, adequate preparation in botany and permission to register. Primarily for graduate students. Lectures and demonstrations, T Th 12. Laboratory, F 1.40–4. Plant Science 114. Professor MACDANIELS.

The morphology of the flowers and fruits and the anatomy of these and other plant parts, particularly as related to physiological function are considered. Emphasis is given the species important in temperate zone horticulture. The course supplements rather than replaces basic courses in general morphology and anatomy.

200. **Seminar.** Throughout the year, without credit. Required of students taking course 201 and of graduate students in pomology. M 11. Plant Science 404. Members of the departmental staff.

201. **Research.** First, second, or both terms. Credit two or more hours a term. Prerequisite, course 131. Professors HEINICKE, MACDANIELS, and OSKAMP and Assistant Professors HOFFMAN, SMOCK, and BOYNTON.

POULTRY HUSBANDRY

Course 1 is a prerequisite for all other courses. Specially qualified students may have this prerequisite waived for some courses by permission of the instructors concerned.

1. **Farm Poultry.** First term. Credit three hours. Lectures, M W F 10. Poultry Husbandry Building 300. One recitation period, to be arranged. Poultry Husbandry Building 305. Assistant Professor HALL, assisted by other members of the staff.

A general course dealing with the practical application of the principles of poultry husbandry to general farm conditions.

110. **Poultry Nutrition.** Second term. Credit three hours. Not open to freshmen. Lectures, T Th 9. Laboratory, T or W 1.40–4. Poultry Husbandry Building 305. Professor HEUSER.

The principles of poultry nutrition and their application to poultry-feeding management.

210. **Experimental Methods in Poultry Nutrition.** First term. Credit two hours. For graduate students. Not given unless ten or more students register. Registration by appointment. Lecture and laboratory period, W 1.40–5. Poultry Husbandry Building. Professor NORRIS.

A critical consideration of the domestic fowl as an experimental animal and of the experimental methods used in conducting research in poultry nutrition.

219. **Seminar in Animal Nutrition.** First and second terms. Open to graduate students only. Registration by permission. Assigned readings on selected topics, with weekly conferences. M 4.15. Professors MAYNARD, MCCAY, and NORRIS.

A consideration of the experimental data on which the principles of animal nutrition are based, and a critical review of current literature.

20. **Poultry Breeds, Judging and Breeding.** First term. Credit three hours. Prerequisite, course 1. Lecture or recitation, M W 11. Poultry Husbandry Building 305. Laboratory, M or T 1.40–4. Breed Observation House. Assistant Professor HALL.

The origin, history, and classification of breeds of domestic poultry; introduction to breeding; judging the principal breeds. A trip is made to one of the leading poultry shows. Laboratory fee, $2.

[120. **Poultry Genetics.** Second term. Credit three hours. Given in alternate years. Prerequisite, Zoology 1, Plant Breeding 101, and permission of the instructor. Open to graduate students, juniors, and seniors. Professor HUTT.] Not given in 1938–39.

Inheritance in domestic birds, the application of genetic principles to poultry breeding, disease resistance, hybrid vigor, cytology, physiology of avian reproduction, fertility, embryonic mortality, sex and secondary sex characters.

220. **Animal Genetics.** First term. For graduate students. Prerequisite, Plant Breeding 101 and permission of the instructor. Hours to be arranged. Professor HUTT.

Assigned readings and conferences on inbreeding; hybridization; disease resistance; lethal genes; genetic sterility; sex; heredity in laboratory animals, domestic animals, and man; sire indices, and other topics. Designed to acquaint the student with the literature and methods of research in animal genetics.

229. **Seminar in Animal Breeding.** Throughout the year. F 4.15. Poultry Husbandry Building 201. Professors HUTT and ASDELL and members of Poultry Husbandry and Animal Husbandry staffs.

Discussion of current literature and special topics of interest to workers in this field.

30. **Incubation and Brooding.** Second term. Credit three hours. Prerequisite, course 1. Lectures, W F 10. Laboratory, Th or F 1.40–4. Poultry Husbandry Building 100. Assistant Professor BRUCKNER.

Principles and practice of incubation and brooding of domestic and game birds; problems of hatchery management.

50. **Market Eggs and Poultry.** Second term. Credit two hours. Prerequisite, course 1. Lecture, M 10. Laboratory, M or T 1.40–4. Poultry Husbandry Building 100. Assistant Professor HALL.

A detailed study of the interior and exterior qualities of eggs, abnormalities, egg grades, and standards; practice in candling, grading, and packing. Grades and standards of market poultry; killing, dressing, and packing. General market information. Laboratory fee, $2.

170. **Poultry Hygiene and Disease.** First term. Credit two hours. Prerequisite, courses 30 and 110, Animal Physiology 10, or Human Physiology 303, and Agricultural Bacteriology 3. Lectures, T Th 10. James Law Hall. Doctor LEVINE.

The course deals with the nature of the infectious and parasitic diseases of poultry and with the principles of hygiene applicable to poultry farming for the prevention and control of diseases.

209. **Seminar in Poultry Biology.** Throughout the year. Required of all graduate students in the department. T 4.15. Poultry Husbandry Building 201. Members of the departmental staff.

A survey of recent literature and research in poultry biology.

RURAL EDUCATION

Courses are grouped by decades: Introductory, 1–9; Psychology, 10–20; Method, 21–40; Preparation of Teachers for Normal Schools and Colleges 41–50; Measurement and Statistics, 51–60; Administration and Supervision, 61–80; Educational Theory, 81–99. See page 25 for a further statement regarding the numbering of courses.

Observation and practice teaching facilities are provided through cooperation with Ithaca and near-by communities.

The plan for the preparation of secondary-school teachers at Cornell involves the following program of 18 hours of professional subjects:

Educational Psychology ..... 3 hours
Course 111 or 112

Principles of Education ..... 3 hours
Course 181

Methods, observation, teaching and extra-instructional problems ..... 9 hours
These are integrated units of work which may be met, for the various groups of teachers, through the following courses:
Teachers of Agriculture, courses 131, 132, 133.
Teachers of Homemaking, courses 135, 136, 137.
Teachers of Biological Science, courses 121, 126, 137, 4d.

Elective ..... 3 hours

Teachers of Homemaking are required to take course 117 (Psychology of Childhood and Adolescence). Other teachers may choose a three-hour course in Education or Psychology subject to the approval of their advisers.

The attention of students is directed to the announcement of the Graduate School of Education.

PSYCHOLOGY

Students other than those preparing to teach vocational agriculture or vocational home economics, who wish course 112, should register for Section 2 at 9 o'clock, first term. Admission of such students to any other section is rigidly limited.

110. **Psychology: An Introductory Course.** First or second term. Credit three hours. Not open to freshmen. M W F 10. Plant Science 233. Professor WINSOR.

Fee, $1.

111. **Psychology for Students of Education.** First term. Credit three hours. Primarily for prospective teachers of vocational agriculture. Open to juniors and seniors. M W F 10. Caldwell 143. Assistant Professor BAYNE.

112. **Psychology for Students of Education.** First or second term. Credit three hours. Prerequisite, course 110, Psychology 1, or the equivalent. Open to second-term sophomores, juniors, and seniors. Section 1, first term, and all sections, second term are primarily for prospective teachers of vocational agriculture and vocational home economics. First term: M W F 9. Section 1, Agricultural Economics Building 125; Section 2, Comstock 145. Second term: Section 1, M W F 9, Agricultural Economics Building 125; Section 2, M W F 9, Comstock 245; Section 3, M W F 10, Agricultural Economics Building 225. Professor KRUSE, Assistant Professor BAYNE, and Doctor GARDNER.

114. **Psychology for Students of Hotel Administration.** First term. Credit three hours. Not open to freshmen. M W F 8. Comstock 245. Professor WINSOR.

117. **Psychology of Childhood and Adolescence.** First or second term. Credit three hours. Open only to students who have had course 111 or 112, or its equivalent. M W F 10. Roberts 392. Professor KRUSE and Doctor GARDNER.

119. **Personnel Administration.** Second term. Credit three hours. Prerequisite, course 114 or its equivalent. M W F 8. Plant Science 233. Professor WINSOR.

211a. **Psychology for Students of Education.** First term. Credit three hours. For mature students with teaching experience. Lectures, M F 11–12.20. Stone 309. Professor KRUSE.

212. **Psychology of Learning.** Second term. Credit two hours. Th 4.15–6. Stone 309. Professor KRUSE.

213. **Psychology of Learning in the School Subjects.** First term. Credit two hours. Prerequisite, a course in educational psychology and permission of the instructor to register. Primarily for graduate students. S 9–11. East Roberts 223. Assistant Professor BAYNE.

216. **Psychology of the Physically Handicapped Child.** Second term. Credit three hours. Prerequisite, course 111 or 112 or equivalent. M W F 11. Agricultural Economics Building 302. Doctor GARDNER.

[218. **Seminar in Educational Psychology.** Second term. Credit two hours. Professor KRUSE.] Not given in 1938–39.

219. **Seminar in Personnel Administration.** Second term. Credit two hours. Open to qualified seniors and graduate students. Th 4.15–6. Comstock 145. Professor WINSOR.

METHOD

121. **Method and Procedure in Secondary School Teaching.** First term. Credit three hours. Prerequisite, course 111 or its equivalent. Open to juniors and seniors. Lectures, M W F 11. Plant Science 143. Professor FERRISS.

The development of certain principles of teaching in secondary schools, and their applications to practical problems of the teacher, such as selecting and organizing teaching materials, making the assignment, directing study, and so forth.

126. **The Teaching of Science in the Secondary School.** First or second term. Credit two hours. Open to seniors on the approval of the instructor. Th 4.15–5.45. Fernow 8. Assistant Professor JOHNSON.

Special methods of teaching science and the organization of science materials in the secondary school. This course is correlated with practice teaching in science. See course 4d, announcement of the Graduate School of Education.

31. **Planning for Agricultural Teaching.** First and second terms. Without credit. Open primarily to sophomores who are planning to teach vocational agriculture in the public schools. Th 4–5, beginning October 6 and continuing on alternate Thursdays during the periods of regular instruction. Plant Science 143. Assistant Professor W. A. SMITH, assisted by other members of the staff in Agricultural Education.

Designed primarily for orientation and guidance and important for assignments to course 131.

131. **Introduction to the Teaching of Agriculture.** First or second term. Credit three hours. (When taken with course 132, only two-hours credit allowed.) Must be preceded or accompanied by course 111 or 112 or its equivalent. Open by permission only to upperclass students whose practical experience and academic standing are satisfactory, and whose progress in the prescribed courses in technical agriculture is adequate. T Th 11 and M 1.40–4. Plant Science 141. Assistant Professor W. A. SMITH.

A consideration of the organization of schools and departments of agriculture in high schools for all-day and out-of-school groups; a study of the opportunities and responsibilities in vocational instruction in agriculture; consideration of teacher qualities; observations of high-school departments of agriculture; and the general preparation of students for the advanced work of course 132. Laboratory fee, $3.

132. **The Teaching of Agriculture in the Secondary School.** First and second terms. Credit three hours a term. Open to juniors and seniors who have completed courses 111 or 112 and 131 or their equivalents, and whose farm experience and academic standing are satisfactory. Given in two sequences, two class periods and one laboratory a week or the equivalent time in directed teaching. Sequence 1. First and second terms. T Th 9. Roberts 392. Assistant Professors HOSKINS and OLNEY. Sequence 2. Second and first terms. T Th 10. Plant Science 143. Assistant Professor OLNEY.

A study of the problems of teaching based upon the planning for and participation in teaching. Opportunity is provided for experience in organizing course materials, in equipping departments, and in planning programs for special groups. Laboratory fee, $5 a term.

133. **Directed Teaching of Agriculture in the Secondary School.** First or second term. Credit to be arranged. Registration subject to conference. Assistant Professors HOSKINS and OLNEY.

Fee, $3 a term.

134. **Adult Education.** First term. Credit three hours. Designed for vocational students. M W F 11. Agricultural Economics Building 125. Professor MOORE.

A consideration of the developments, trends, opportunities, and problems of adult education.

[134a. **Special Agricultural Education for Out-of-School Youths and Adults.** First term. Credit three hours. Assistant Professor HOSKINS.] Not given in 1938–39.

[134b. **Adult Homemaking Education.** Credit three hours. For extension workers, home-economics teachers, and others interested in leadership in homemaking education. Miss HENDERSON.] Not given in 1938–39.

135. **The Teaching of Home Economics in the Secondary School.** First or second term. Credit three hours. Prerequisite, course 111, 112, or the equivalent. Required of all students preparing to teach home economics. Lecture, Th 2–4.20. Caldwell 143. Miss HUTCHINS.

One period daily for observation and participation in the Ithaca Junior High School throughout the semester. Schedules must be approved by the Department of Rural Education.

This course purposes to interpret present-day educational theories and practices as applied to home economics; to study the activities in which the home economics teacher engages, and the factors which make for successful performance; to induct students into teaching through graded participation in the home arts department of the Ithaca Junior High School. Fee, $2.

136. **Directed Teaching of Home Economics in the Secondary School.** First or second term. Credit four hours. Prerequisite, course 135. Open to seniors who have successfully completed prerequisites in Education and have been approved by a committee composed of members of the faculties of Home Economics and Rural Education. General conferences, S 8–10. Stone 309. Professor BINZEL and Misses HASTIE and COWLES.

Schedules must provide three entire days a week over a period of five weeks for directed teaching. Visits to schools for the purpose of studying furnishings and equipment are a part of the course. Fee, $10.

137. **Extra-Instructional Problems.** First or second term. Credit two hours. First term for prospective teachers of home economics only. Second term for prospective teachers of science and home economics. T Th 9. First term, Plant Science 143; second term, Comstock 145. Professor FERRISS.

This course is designed to deal with problems confronting the teachers in the performance of those duties and the meeting of those responsibilities in the school that extend beyond the classroom and class instruction.

[222. **Principles of Method.** Second term. Credit three hours. Given in alternate years. Prerequisite, course 211a or its equivalent and teaching or comparable experience in agriculture, homemaking, or science. Professor STEWART.] Not given in 1938–39.

226. **Research in Science Teaching.** First or second term. Credit one or two hours a term. M 4.30. Fernow 8. Professor PALMER and Assistant Professor JOHNSON.

Special problems in science teaching.

227. **Seminar in Elementary Education.** First term. Credit two hours. M 4–6. Stone 309. Professor MOORE.

Topics to be determined by the interests of the members.

228. **Seminar in Behavior and Guidance (Family Life 228).** Second term. Credit two hours. For graduate students who have had some work in child guidance. F 4–6. Martha Van Rensselaer Hall 121. Professor WARING.

The seminar discusses the sources in the psychologies, past and present, for studying principles of learning and teaching that can be relied upon in homes, in schools, and in all family and social living, and attempts to apply these principles to the homely everyday problems of behavior and guidance.

232. **Seminar in Curriculum and Teaching Problems in Agricultural Education.** Second term. Credit two hours. T 4–5.30. Stone 309.

a. 1938–39. The location, analysis, and disposition of problems of research discovered in teachers' programs in the secondary school. Assistant Professor HOSKINS.

[b. 1939–40. The selection, editing, and evaluation of instructional materials for teachers of agriculture.] Not given in 1938–39.

233. **Apprentice Teaching in Secondary Agriculture.** First or second term. Credit to be arranged. Professor STEWART, Assistant Professors HOSKINS and OLNEY.

Certain students with advanced directed teaching experience may be permitted to accept regular teaching responsibilities in the schools under staff supervision, where opportunities arise.

[234. **Seminar.** First term. Credit two hours. Professor BUTTERWORTH.] Not given in 1938–39.

[240. **Cooperative Extension Work.** Second term. Credit three hours. Open to graduate students qualified in agriculture or home economics. Professor EATON.] Not given in 1938–39.

PREPARATION OF TEACHERS FOR NORMAL SCHOOLS AND COLLEGES

241. **The Preparation of Teachers for Normal Schools and Colleges.** Second term. Credit two hours. M 4–6. Caldwell 143. Professor MOORE.

To meet the needs of those responsible for the training of teachers for rural elementary and secondary schools.

243. **Problems of College Teaching.** Throughout the year. Credit one hour a term. Open to graduate students intending to teach in higher institutions. Time of meeting once a week will be arranged after a preliminary conference with students at a session to be announced at the opening of the first term. Professor EATON.

245. **The College Preparation of Teachers of Agriculture for the Secondary School.** Second term. Credit three hours. Should follow course 211a or its equivalent. T Th 11–12.20. Stone 309. Professor STEWART.

A course based upon the work of teachers of agricultural vocations in secondary schools, designed to provide standards for a program of teacher-education in a college of agriculture.

246. **Problems in Industrial and Technical Education.** First and second terms. Credit four hours a term. T Th 2–4. Stone 309. Professor L. A. EMERSON.

Special problems in the administrative, supervisory, and curricular phases of industrial and technical education.

248. **The Preparation of Teachers of Home Economics for Secondary Schools.** Second term. Credit two hours. T Th 11. East Roberts 223. Professor ————.

This course is designed to meet the needs of persons who have had both technical preparation in home economics and teaching experience, and who desire to prepare for the special problems involved in the professional work of preparing teachers of home economics for secondary schools.

249. **Seminar in Home Economics Education.** First term. Credit two hours. Time to be arranged. Course content to be adapted to personnel of class. Professor ————.

250. **Seminar in Agricultural Education.** First term. Credit two hours. Open only to students whose progress in graduate study is satisfactory. T 4–5.30. Plant Science 141. Professor STEWART.

The place of agriculture in the secondary school; its organization and administration.

MEASUREMENT AND STATISTICS

251. **Educational Measurement.** Second term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. Prerequisite, a course in educational psychology. Open to graduate and upperclass students. M W F 8. Stone 309. Assistant Professor BAYNE.

The use of aptitude and achievement tests and other measuring instruments in the classification and guidance of pupils, improvement of instruction and other activities of the teacher and school officer. Those class members who wish may make a study of their own aptitudes and achievements.

253. **Statistics for Students of Education.** First term. Credit two hours. Primarily for graduate students in education. Open to a limited number of other students upon approval of the instructor. T Th 10. East Roberts 223. Assistant Professor BAYNE.

A study of common statistical procedure in relation to critical reading of technical studies, research, and to writing reports of studies. In so far as possible the work is related to the problems of the individual student.

ADMINISTRATION AND SUPERVISION

261. **The Administration of Rural Schools.** First term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. T Th 11 and an additional hour to be arranged. Stone 309. Professor BUTTERWORTH.

A course for students of experience, dealing with the problems of organizing and administering education in the elementary and secondary schools in country and village districts.

[262a. **School Finance.** Second term. Credit two hours. Professor BUTTERWORTH.] Not given in 1938–39.

262c. **The School Plant.** Second term. Credit two hours. M 4–6. Stone 309. Professor BUTTERWORTH.

Standards for school buildings; measurement of school building facilities; planning the school program to meet the needs of the community; the financing of school buildings; modern equipment for the school plant; and similar problems.

263. **Procedures and Technic in Supervision.** First term. Credit three hours.

Candidates for a principal's certificate may register for two-hours credit. M W F 10. Stone 309. Professor MOORE.

Designed for superintendents, supervisors, and principals. Students who have not had experience in these fields are admitted only upon permission of the instructor. Students taking this course must be prepared to spend four full days or more in observing supervisory procedures in various school systems.

264. **Seminar in Rural School Administration.** Second term. Credit two hours. S 10–11.30. Stone 309. Professor BUTTERWORTH.

Designed for those desiring to make an intensive study of administrative problems in rural elementary and secondary schools. Topic to be announced.

265. **Seminar for Principals.** Second term. Credit two hours. Required of all graduate students who are candidates for a principal's certificate. W 4–5.40 and additional time to be arranged. Stone 309. Professor FERRISS.

266. **The Supervision of the Elementary School Subjects.** Second term. Credit three hours. Candidates for a principal's certificate may register for two-hours credit. M W F 9. Stone 309. Professor MOORE.

A course designed for supervisors, elementary-school principals, and superintendents. It includes a consideration of important research studies which have a direct bearing upon the teaching and supervision of the elementary-school subjects.

[267. **The Organization and Administration of Agricultural Education in the Secondary School.** Second term. Credit three hours. Given in 1939–40. See course 250. Professor STEWART.] Not given in 1938–39.

[269. **The Supervision of Home Economics Education.** First term. Credit two hours. Professor BINZEL.] Not given in 1938–39.

276. **Principles of Curriculum Building.** Second term. Credit three or four hours. Primarily for graduate students. T Th 2–3.20, and an additional hour to be arranged for those wishing to carry further the study of special curriculum problems. Agricultural Economics 340. Professor FERRISS.

A consideration of the major problems, principles, and technics in determining educational objectives and curriculum content and organization.

[278. **Seminar in Rural Secondary Education.** Second term. Credit two hours. Given in alternate years. Professor FERRISS.] Not given in 1938–39.

EDUCATIONAL THEORY

181. **Principles of Education.** First or second term. Credit three hours. Prerequisite, a first course in educational psychology. One section first term; two sections second term. Open to students as indicated by sections. First term, M W F 11. Open only to seniors and graduate students preparing to teach. Second term: Section 1, M W F 9. Open only to seniors and graduate students preparing to teach. Section 2, M W F 11. Open to juniors preparing to teach science and to seniors and graduate students preparing to teach. Caldwell 143. Professors MOORE and EATON.

A consideration of fundamental principles in education, with special attention to the needs of prospective teachers in the high school.

194. **Philosophy of Vocational Education.** First term. Credit three hours. Open to seniors and graduate students qualified in educational psychology, and economics or sociology. M W F 9. Caldwell 143. Professor EATON.

A study of the theory of vocational education in the large.

281. **Rural Secondary Education.** First term. Credit three hours. Primarily for graduate students. M W F 9. Stone 309. Professor FERRISS.

A course to consider some of the more basic problems in the nature, organization, curriculum, and extension of secondary education in its adaptation to rural needs and conditions.

294. **Philosophy of Education.** Second term. Credit three hours. Open to graduate students in education. M W F 11. Stone 309. Professor EATON.

An examination of the concepts of education and of the bearing of several major theories of life upon education.

[295. **Comparative Education.** First term. Credit two hours. Professors BUTTERWORTH, FERRISS, and MOORE.] Not given in 1938–39.

NATURE STUDY

107. **The Teaching of Nature Study and Elementary-School Science.** Second term. Credit three hours. Open to those who have taken or are completing thirty hours in science and have had at least one term of suitable professional work. Lecture, M 12. Fernow 8. Practical exercises, T Th 1.40–4. Professor PALMER and Miss GORDON.

A study of the content and methods of nature-study and elementary-school-science programs, with consideration of their significance to agriculture and to secondary-school science. Recommended for those preparing to teach or supervise science.

108. **Field Natural History.** First term. Credit two hours. Not open to freshmen. Lectures, Th 1.40–2.30. Fernow 8. Field work, Th 2.30–5. Professor PALMER and Miss GORDON.

Field trips and lectures devoted to a study of the natural history of five ecological units under different seasonal conditions, with special emphasis on their contributions to the teaching of science.

202. **Nature Literature.** First term. Credit two hours. Open to students who will have completed their preparation for certification as science teachers by the end of the current year. M W 10. Fernow 8. Professor PALMER and Miss GORDON.

Acquaintance with prose, poetry, and fiction useful in enriching science courses in elementary and in secondary schools with critical examination of nature and science texts for these grade levels.

[209. **The Nature Movement and Its Makers.** First term. Credit two hours. Professor PALMER and Miss GORDON.] Not given in 1938–39.

RESEARCH

300. **Special Studies.** Credit as arranged. Members of the staff.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

RURAL SOCIAL ORGANIZATION

1. **General Sociology.** First or second term. Credit three hours. Open to sophomores. Lectures and discussions, M W F 8. Agricultural Economics Building 25. Professor ANDERSON.

This course precedes all others in the department. Its object is to create an understanding of various types of groups, institutions, and organizations that exist in human society. It is an analysis of the human environment in which the individual lives. Both urban and rural society are considered. Fee for materials, $1.

207. **Sociological Theory.** First and second terms. Credit three hours a term. Prerequisite, permission to register. T Th S 9. Agricultural Economics Building 302. Professor ANDERSON.

A course devoted to the critical analysis of sociological theories from the time of Auguste Comte to those of present day sociologists.

[208. **Systematic Sociology.** First and second terms. Credit three hours a term. For graduate students. Professor ANDERSON.] Not given in 1938–39.

This course is designed to present the whole field of study, with special emphasis on the concepts in a system of sociology.

209. **Seminar.** Second term. Credit two hours. For graduate students. F 2–4. Agricultural Economics Building 302. Professor SANDERSON.

The structural characteristics and classification of different types of social groups as related to their functions are studied.

111. **Rural Community Organization.** Second term. Credit two hours. Prerequisite, courses 1 and 12 or the permission of the instructor. Open to juniors, seniors, and graduate students. Lectures and discussions, W F 8. Agricultural Economics Building 340. Professor SANDERSON.

The application of sociology to the practical problems of community organization. The course covers three main divisions: the use of community organization as a tool for guiding social change; a critical study of New York State rural-community organizations; methods of making organizations effective through developing rural leadership, analyzing community needs, building community programs, and coordinating programs. Fee for materials, $2.

211. **The Rural Community.** First term. Credit two hours. Primarily for graduate students. Prerequisite, courses 1 and 12 or their equivalent. F 2–4. Agricultural Economics Building 302. Professor SANDERSON.

A study of the historical development of the rural community; a comparative study of types of rural communities; the rural community as a sociological group and its place in society; methods of community development and organization.

12. **Rural Sociology.** First term. Credit three or four hours. Course 1, or its equivalent, is recommended as prerequisite, but not required. Lectures, discussions, and special reports, T Th S 11, and period to be arranged for those electing four hours. Agricultural Economics Building 340. Professor SANDERSON.

A study of the groups, organizations, and institutions found in rural society, their structure and function, and a consideration of means for the improvement of rural social organization.

Those electing four-hours credit meet for an extra period in groups, to prepare reports on special topics and for discussion. Fee for materials, $2.

112. **Rural Recreation.** Second term. Credit two hours. For juniors and seniors planning to engage in rural work. Prerequisite, course 1 or 12. T 8. Agricultural Economics Building 302. A two-hour laboratory period, to be arranged. Extension Assistant Professor DUTHIE.

A general orientation in the various types of recreational activities, and the methods in which they may be organized to best serve the needs of the rural community.

213. **Research in Rural Social Organization.** Throughout the year. For qualified juniors, seniors, and graduate students. Hours and credits to be arranged. Professors SANDERSON, ANDERSON, and COTTRELL.

[218. **Seminar.** First term. Credit two hours. For graduate students. Professors SANDERSON, ANDERSON, and COTTRELL.] Not given in 1938–39.

A study of research methods in rural sociology.

[219. **Seminar: Quantitative Methods in Sociology.** Second term. Credit three hours. Prerequisite, one course in statistics and permission of instructor. Professor COTTRELL.] Not given in 1938–39.

A consideration of the special problems involved in the application of quantitative methods to sociological and social-psychological research. This seminar alternates with course 231.

121. **The Family.** First or second term. Credit three hours. Open to juniors, seniors, and graduate students; open to sophomores who desire to take course 123 later, upon permission of the instructor. Prerequisite, course 1 or its equivalent. Lectures, discussions, and reports. T Th S 8. Agricultural Economics Building 340. Professor COTTRELL.

This course considers the family as a social institution with a history and with contrasting forms and functions in different cultures. Attempt is made to understand the effects of contemporary social change on the modern family and in turn the results in society of a changing family. As a basis for understanding the central importance of the family, considerable attention is devoted to the social-psychology of marriage and family relations. Fee for materials furnished, $1.

221. **Seminar: The Family.** First and second terms. Credit two hours a term. T 2–4. Martha Van Rensselaer Hall 121. Professors COTTRELL and ROCKWOOD.

122. **Social Problems and Public Welfare Organization.** Second term. Credit three hours. Prerequisite, course 1. M W F 11. Agricultural Economics Building 340. Professor COTTRELL.

A study of the underlying factors in social phenomena usually regarded as symptomatic of personal and social mal-functioning, such as dependence, delinquency, crime, insanity, community disorganization, and the like. Consideration is given to the methods by which society attempts to deal with the problems involved.

123. **Social-Work Practice.** Throughout the year. Open only to juniors and seniors interested in becoming social workers, scout executives, or Camp Fire leaders. This course is offered for the purpose of orienting students who may contemplate entering social work. It is not designed to afford professional training. It consists of individual work at neighborhood houses or in connection with social welfare organizations. Qualified Girl Scouts or Camp Fire Girls may obtain training as assistant troup leaders. Hours and credit to be arranged. Professors SANDERSON and COTTRELL.

131. **The Social Psychology of Rural Life.** First term. Credit three hours for undergraduate students, four hours for graduate students. Prerequisite, course 1 or its equivalent and one course in psychology. T Th S 10. Agricultural Economics Building 340. Professor COTTRELL.

A study of (1) the organization and functioning of personality regarded as a product of social interaction; and (2) the dynamics of interaction of persons in intra-group and inter-group relations. An attempt is made to develop an integrated social-psychological theory which is relevant to both personal and group behavior. Special application is made to the study of the social psychology of rural life. Fee for materials, $1.

132. **Rural Leadership.** Second term. Credit two hours. Prerequisite, course 1 and, permission of instructor. Th 2. Agricultural Economics Building 302. Professor SANDERSON.

A seminar course in which leadership is studied from both sociological and psychological points of view.

133. **Rural Group Leadership.** First term. Credit two hours. Open with permission of instructor to upperclass students who have had practice in leadership or are taking course 123 at the same time. T 8, and hour to be arranged. Agricultural Economics Building 302. Extension Assistant Professor DUTHIE.

A consideration of the factors involved in group formation, the relationships of the leader to the group, and the group members to each other. The place of the program in group work and the process of program formation are described, with special reference to work with 4-H Clubs, Scouts, and juvenile groups.

239. **Seminar.** The Social Psychology of Rural Life. Second term. Credit two hours. Prerequisite, course 131. W 2–4. Agricultural Economics Building 302. Professor COTTRELL.

A critical examination of the methods and results of research in social psychology. Special attention is given to the development of research methods applicable to the study of personality, social attitudes, public opinion, propaganda, and collective behavior, particularly in rural society. This course alternates with course 219.

Attention is also directed to related courses offered by the Department of Family Life in the College of Home Economics, and to the following courses in Social Science, Department of Economics, described in the Announcement of the College of Arts and Sciences.

51. **Population Problems.** First term. Credit three hours.

55. **Social Anthropology.** First term. Credit three hours.

56. **Social Anthropology of Religion and Ethics.** Second term. Credit three hours.

58. **Seminar in Anthropology and Sociology.** Second term. Credit two hours.

VEGETABLE CROPS

Students planning to specialize to a greater or less degree in vegetable crops should consult the department regarding choice and sequence of courses. A mimeographed sheet outlines the suggestions.

1. **Vegetable Crops.** Second term. Credit three hours. Lectures, M W 11. East Roberts 222. Laboratory, M T or W 1.40–4. Vegetable greenhouses and East Ithaca gardens. Professor WORK.

A general study of the principles of vegetable growing and handling, giving a comprehensive survey of the industry. Intended for the student who desires a brief general course, and as an introductory course for the student who wishes to specialize in commercial vegetable growing. Economic importance, geography, cultural requirements, marketing, storage, and uses, of the important vegetables. A one-day trip is required; approximate cost, $2. Laboratory fee, $2.

2. **Special Cash Crops.** Second term. Credit three hours. Lectures, T Th 10. East Roberts 222. Laboratory, T W or Th 1.40–4. East Roberts 223. Professor HARDENBURG.

A study of those crops which are grown in New York principally as cash crops and for manufacture, including potatoes, field beans, field cabbage, and the important canning crops, peas, tomatoes, sweet corn, and snap beans. About one-half of the term's work is devoted to potatoes. A visit to near-by bean elevators is required; approximate cost, $1. Laboratory fee, $2.

12. **Grading and Handling Vegetable Crops.** First term. Credit three hours. Lectures, T Th 10. East Roberts 222. Laboratory, T W or Th 1.40–4. East Roberts 223. Vegetable greenhouses, and East Ithaca gardens. Professor WORK.

Geography of vegetable production and distribution. Factors of environment, culture, and handling as affecting quality, condition, and marketing of vegetable crops. Harvesting, grades and grading, packing, shipping-point and terminal-market inspection, transportation, refrigeration, and storage are discussed with reference to the various crops. A two-day trip is required; maximum cost, $8. Laboratory fee, $2.50.

101. **Vegetable Crops, Advanced Course.** Second term. Credit four hours. Prerequisite, course 1 and Botany 31. Lectures, M W F 9. One conference period to be arranged. East Roberts 223. Professor THOMPSON.

A course devoted to a systematic study of the sources of knowledge and opinions as to practices in vegetable production and handling. Results of experiments that have been concluded or are being conducted are studied, and their application to the solution of practical problems is discussed.

113. **Types and Varieties of Vegetables.** First term. Credit three hours. Prerequisite, course 1 or 2, or permission to register. Lecture and laboratory, M 1.40–4. East Ithaca gardens or East Roberts 223. Professor WORK.

One week of laboratory work preceding the beginning of regular instruction is required, from September 22 to 28, 1938. Report at East Ithaca at 9 a.m., September 22. The department should be notified of intention to register in this course.

This course deals with the taxonomy, origin, history, characteristics, adaptation, identification, classification, exhibition, and judging, of kinds and varieties of vegetables; the characteristics, production, and handling of vegetable seeds. The leading varieties of the vegetable crops are grown each year. The value of the course depends to a great extent upon gaining an acquaintance with the plant material as it grows. For this reason part of the laboratory work is done in the gardens prior to and during registration week. Laboratory fee, $2.

[121. **Morphology and Anatomy of Vegetable Crop Plants.** First term. Credit two hours. Prerequisite, course 1 and Botany 1. Professor ————.] Not given in 1938–39.

A study of the anatomy and development of the roots, stems, leaves, flowers, fruits, and seeds, and of the reproductive processes of vegetable-crop plants.

225. **Special Topics in Vegetable Crops.** First term. Credit three hours. Prerequisite, course 101 and Botany 31. Primarily for graduate students. It is

recommended that Botany 231 and 232 precede or accompany this course. Discussions, M W F 9. East Roberts 223. Professors THOMPSON and KNOTT and Assistant Professor PLATENIUS.

In this course the student is expected to review critically and to evaluate the more important research publications that deal with vegetable production, handling, and storage problems. In the discussions attention is given to research methods and technics.

231. **Research.** Throughout the year. For graduates and advanced undergraduates. Credit for undergraduates one or more hours a term, by arrangement. Professors THOMPSON, WORK, HARDENBURG, KNOTT, and ORA SMITH and Assistant Professor PLATENIUS.

Special problems may be elected in any line of vegetable work. Summer residence is often necessary in connection with experimental problems.

232. **Seminar.** First and second terms. Required of graduate students taking either a major or a minor in this department. Time to be arranged. East Roberts 223. Members of departmental staff.

WILD-LIFE CONSERVATION AND MANAGEMENT

1. **The Conservation of Wild Life.** First term. Credit two hours. Lectures, T Th 11 and occasional evenings. Fernow 122. Professors ALLEN, HOSMER, WIEGAND, ADAMS, EMBODY, PALMER, and A. H. WRIGHT and Assistant Professors YOUNG, SUTTON, HAMILTON, and MOTTLEY, Doctor KELLOGG, and cooperating specialists.

An introduction to the wild-life resources of North America; the importance of the flora and fauna in our economic and cultural life; the history of its decimation, the present need for conservation, and the methods employed to reestablish the various species.

2. **Game Management.** First term. Credit three hours. Prerequisite, Botany 13 and Ornithology 126 or 131. Lecture, F 11. Fernow 212. Laboratory and field work, S 8–1, and at least four all-day Saturday trips. Professor ALLEN and cooperating specialists from the New York State Conservation Department, the United States Biological Survey, and others.

The principles and practices of game management as applied to field, woodland, and aquatic game. Laboratory studies of game species, predators, cover maps, management plans, and feeding methods. Field work includes demonstrations and practice in game surveys, sanctuary and refuge methods, and other game-management practices. Laboratory fee, $3.

ZOOLOGY

8. **Elementary Taxonomy and Natural History of Vertebrates.** First and second terms. Credit three hours a term. Lecture, M 8. Laboratory, M W 1.40–4 or T Th 1.40–4. McGraw 7. Professor WRIGHT, Assistant Professor HAMILTON, and Mr. RANEY.

Lectures on fishes, amphibians, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and bionomics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. Several all-day field trips are taken during the year. During May field trips will be taken at 5.30 a. m. Laboratory fee, $4.50.

9. **General Ornithology.** Second term. Credit three hours. Lecture, W 11. Fernow 122. Field work and laboratory, M W 1.40–4 or T Th 1.40–4. Fernow 210. Professor ALLEN, Assistant Professor SUTTON, and Doctor KELLOGG.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology. Laboratory work with bird skins is based on the field work. Laboratory fee, $3.

Students completing this course may arrange, under course 300j, to pursue advanced work during their junior and senior years.

[22. **Ichthyology, Advanced Systematic and Field Zoology.** Throughout the year. Credit three hours a term. Professor WRIGHT and Assistant Professor HAMILTON.

An amplification of the prerequisite course 8. In the lectures, special emphasis is laid on the principal phases of animal life; the taxonomy, origin, and evolution of fossil and living groups; geographical distribution; and the literature and institutions of zoology. Laboratory periods are devoted to the identification of exotic and indigenous forms. Laboratory fee, $3.

23. **Herpetology (Amphibia).** First term. Credit three hours. Lectures, T Th 8. McGraw 7. Laboratory, S 8–10.30. Professor WRIGHT and Assistant Professor HAMILTON.

Laboratory fee, $3.

24. **Herpetology (Reptilia).** Second term. Credit three hours. Lectures, T Th 8. McGraw 7. Laboratory, S 8–10.30. Professor WRIGHT and Assistant Professor HAMILTON.

Laboratory fee, $3.

[25. **Mammalogy.** First and second terms. Credit three hours a term. Professor WRIGHT and Assistant Professor HAMILTON.] Not given in 1938–39.

Discussion of principal phases of mammalian life: origin, distribution, habits, and literature. Laboratory periods are devoted to methods of field collecting, census taking, life-history studies, preparation of skins and skeletons, and identification of North American species. Laboratory fee, $3.

67. **Seminar in Systematic Vertebrate Zoology.** First and second terms. Credit one hour a term. Hours to be arranged. Professor WRIGHT.

Life-zone plans of North America, 1817–1937. Distribution and origin of life in North America. Zoogeography of the Old World. Animal coloration. Other topics, to be announced.

110. **Economic Zoology.** First term. Credit one hour. Open to qualified upperclassmen and graduate students. Lecture, W 10. McGraw 7. Several field trips to be arranged. Assistant Professor HAMILTON.

This course is designed to meet the needs of the teacher, agriculturist, extension worker, and professional zoologist. Among the topics treated are: control of injurious mammals, fur-farming, economics of the raw fur crop, game mammals, manner of effecting legislation, and a consideration of the laws and their effectiveness in various States.

112. **Literature of Economic Zoology, Conservation, and Ecology.** Second term. Credit one hour. Th 7.30 p. m. McGraw 7. Professor WRIGHT and Assistant Professor HAMILTON.

The literature of economic zoology, ecology, limnology, oceanography, and kindred fields; fish and fisheries (for profit and pleasure); amphibians and reptiles, their uses; small and big game (commercial and sport); aquaria; zoological gardens; preserves; game farms; animals in relation to recreation, settlement, forestry, agriculture, and other industries; biologic resources, their exploration, conservation, utilization, and management.

126. **Advanced Ornithology.** First term. Credit three hours. Prerequisite, course 9. Lecture, W 11. Laboratory, T Th 1.40–4. Fernow 210. Professor ALLEN, Assistant Professor SUTTON, and Doctor KELLOGG.

The structure and classification of birds; geographical distribution; the literature and institutions of ornithology; identification of representative birds of the world. The first part of the term is devoted to field work on the fall migration, and to the identification of birds in winter plumage. Designed primarily for students specializing in ornithology or animal biology. Laboratory fee, $3.

131. **Applied Ornithology.** First term. Credit three hours. Should be preceded by course 9, and presupposes an elementary knowledge of botany and entomology. Lecture, W 9. Laboratory, M W 1.40–4. Fernow 210. Professor ALLEN, Assistant Professor SUTTON, and Doctor KELLOGG.

This course is intended primarily for students planning to teach biological science or to engage in professional work in ornithology or wild-life management. Field collecting, preparation of specimens, and natural-history photography are emphasized, together with classroom, museum, and biological survey methods. Laboratory fee, $3.

136. **Seminar in Ornithology.** Throughout the year. Without credit. Open to qualified undergraduates and required of all graduate students in ornithology. M 7.30–9. Fernow Seminar Room.

300. **Zoological Problems.** Throughout the year. Credit hours variable. Admission by consent of the instructor.

300j. **Ornithology.** Professor ALLEN, Assistant Professor SUTTON, and Doctor KELLOGG.

300k. **Vertebrate Taxonomy and Natural History.** Professor WRIGHT and Assistant Professor HAMILTON.

COURSES IN OTHER COLLEGES THAT MAY BE OFFERED TO MEET THE SPECIFIC REQUIREMENTS OF REGULAR STUDENTS IN THE COLLEGE OF AGRICULTURE

2. **English: Introductory Course in Composition and Literature.** Throughout the year. Credit three hours a term. May not be entered the second term. M W F 8, 9, 10, 11, 12, and T Th S 8, 9, 10, 11. Rooms to be announced. Messrs. TENNEY, GUSTAFSON, JONES, LIPA, MAURER, MOORE, MYERS, SALE, THOMPSON, WIENER, E. C. WILSON, L. C. WILSON, and others.

The course, open to freshmen who have satisfied the entrance requirements in English, is a training in the reading and writing of English. All those who elect this course must apply as follows for assignment to sections: the first term at the Drill Hall; the second term at Goldwin Smith C. Assistant Professor TENNEY is in charge of the course.

2a. **English: Introductory Course in Composition and Literature.** Second term. A repetition of the first term of English 2. T Th S 8. Goldwin Smith 142.

102. **General Chemistry.** Throughout the year. Credit three hours a term. Both terms of the course must be completed to obtain credit unless the student is excused by the department. Open only to those students who do not offer entrance chemistry. Lecture, Th or F 11. Baker, Main Lecture Room. Recitation, one hour a week to be arranged. Laboratory, M T W Th or F 1.40–4. Professors BROWNE and LAUBENGAYER and assistants.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds. Deposit, $11 each term.

104. **General Chemistry.** Throughout the year. Credit three hours a term. Both terms of the course must be completed to obtain credit unless the student is excused by the department. Prerequisite, entrance credit in chemistry. Lecture, M or T 11. Baker, Main Lecture Room. Recitation, one hour a week to be arranged. Laboratory, M T W Th or F 1.40–4. Professor LAUBENGAYER, Doctor HOARD, and assistants.

This course deals with the fundamental laws and theories of chemistry and the properties of the more common elements and their compounds. Deposit, $11 each term.

100. **Introductory Geology.** First or second term. Credit three hours. Lectures, T Th 9. Sibley Dome. Laboratory, M T W Th or F 1.40–4, or S 8 if necessary. McGraw. Students must register for laboratory assignment before the beginning of the course. Professor RIES, and Messrs. BERTHIAUME and RODGERS.

This course is planned to give beginners the fundamental principles of this branch of science. The inorganic aspects of the subject are emphasized more than are the organic.

1. **Hygiene.** First term. Credit one hour. One lecture-recitation each week, with preliminary and final examination. The use of a textbook is required.

Sections for men: Professor SMILEY, Assistant Professors GOULD, SHOWACRE, DEYOE, and ROSE, and Doctor PARRATT.

Sections for women: Assistant Professor EVANS and Drs. CUYKENDALL and STELLE.

Students must report for registration and assignment to sections, the men at the Old Armory, the women at Sage Gymnasium.

2. **Hygiene.** Second term. Credit one hour. One lecture-recitation each week, with preliminary and final examination. The use of a textbook is required.

Sections for men: Professor SMILEY, Assistant Professors GOULD, SHOWACRE, DEYOE, and ROSE, and Doctor PARRATT.

Sections for women: Assistant Professor EVANS and Drs. CUYKENDALL and STELLE.

Students must report for registration and assignment to sections, the men at the Old Armory, the women at Sage Gymnasium.

3. **Introductory Experimental Physics.** First term. Credit three hours. Demonstration lectures, M F 9 or 11. Rockefeller A. Professor HOWE. One laboratory period a week, as arranged. Rockefeller 220. One recitation period a week, as arranged, required of students who do not offer entrance physics, but open to others. Professor HOWE, Assistant Professor BACHER, Doctor SHAW, Messrs. BAROODY, CONNELLY, MCCUE, and RANDALL, and Miss WITTERS.

Mechanics, properties of matter, sound, and heat.

4. **Introductory Experimental Physics.** Second term. Credit three hours. A continuation of course 3. Prerequisite, course 3 or entrance physics. Lectures, M F 9 or 11. Assistant Professor BACHER. Laboratory staff as in course 3.

Electricity, magnetism, and light.

10. **Animal Physiology.** First or second term. Credit three hours. A course of lectures or recitations arranged especially for students in Agriculture, but open to others. Students taking this course should be familiar with the first principles of chemistry. Permission to register is not required. First term, M W F 9; second term, M W F 10. Veterinary College. Professor HAYDEN.

303. **Human Physiology.** First or second term. Credit three hours. Lectures, demonstrations, and discussion periods. M W F 10. Stimson Amphitheater. Assistant Professor DYE.

An introductory course designed particularly for those students who intend to take only one course in physiology, for those who expect to teach biology in the secondary schools, and for those who desire a general knowledge of the physiological processes as applied to the human body.

1. **Modern Economic Society.** First or second term. Credit five hours. Not open to freshmen. Daily except S 8, 9, 10, 11, 12. Professor O'LEARY.

Students should register, if possible, on the first day of registration. Section assignments are made at Goldwin Smith 260 on registration days. In the first term the registration is limited in number.

A survey of the existing economic order, its more salient and basic characteristics, and its operation.

1. **Introductory Zoology.** First and second terms. Credit three hours a term. Lectures, T Th 9 or 11. Goldwin Smith B. Laboratory, M T W Th or F 1.40–4, T W S 10–12.20, or S 8–10.20. McGraw 104. Assistant Professor YOUNG, Doctor MEKEEL, and Messrs. CAMERON, GILBERT, and JACKSON.

A comprehensive view of the subject of animal biology including the principles of structural and functional organization in the body, the animal as a living organism, the origin and perfection of animal types, together with a consideration of zoological generalizations and the application of biological principles to man. Fee, $3 a term.

UNIVERSITY REQUIREMENTS IN MILITARY SCIENCE AND TACTICS, AND PHYSICAL TRAINING

Military Science and Tactics

1. **Basic Course.** Required. Throughout the year. The complete course covers two years. Every able-bodied male student, a candidate for a baccalaureate degree, who is required to take five, six, seven, eight, or more terms in residence (or the equivalent in scholastic hours), must take, in addition to the scholastic requirements for the degree, one, two, three, or four terms, respectively, in the Department of Military Science and Tactics. Three hours a week, M T W or Th 1.40–4.10 p. m. New York State Drill Hall.

The requirements in Military Science and Tactics must be completed in the first terms of residence; otherwise the student will not be permitted to register again in the University without the consent of the University Faculty.

Aliens or others who are officially relieved of the requirement in Military Science and Tactics are subject to the requirement of an equivalent period of work in the department of physical training.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers' Training Corps for basic students. Instruction is offered in Infantry and Field Artillery. For details concerning the course see the Announcement of the Department of Military Science and Tactics.

Physical Training

1. **Physical Training for Men Excused from Drill (Freshmen).** Throughout the year, three periods a week. Class and squad work and prescribed exercises. Mr. O'Connell and assistants.

2. **Physical Training for Men Excused from Drill (Sophomores).** Throughout the year, three periods a week. Class and squad work and prescribed exercises. Mr. O'Connell and assistants.

3. **Physical Training for Men (Juniors and Seniors).** Building-up and corrective exercises as prescribed by the medical examiners as a result of the physical examination required of all students in the University. Mr. McBride.

6. **Physical Training for Women (Freshmen).** Throughout the year, three periods a week. Misses Bateman, Ashcroft, Atherton, Barrow, and Thorin.

7. **Physical Training for Women (Sophomores).** Throughout the year, three periods a week. Misses Bateman, Ashcroft, Atherton, Barrow, and Thorin.

The program consists of: six weeks of outdoor sports in fall and spring; archery, baseball, canoeing, field hockey, golf, soccer, tennis, and volleyball. Indoor classes in badminton, basketball, fencing, folk, tap, and modern dancing, golf, individual gymnastics, riflery, swimming, and volleyball.

ELECTIVE COURSES IN MILITARY SCIENCE AND TACTICS, AND HYGIENE AND PREVENTIVE MEDICINE

A description of all other courses available for election by students in the College of Agriculture may be found in the announcements of the other colleges of the University.

Military Science and Tactics

2. **Advanced Course.** Elective. Throughout the year. The complete course covers two years. Credit two hours a term. Prerequisite, course 1 in the arm or service selected. Five hours a week, and in addition attendance at a Summer Training Camp of six-weeks duration. Hours by assignment. New York State Drill Hall.

The course of training is that prescribed by the War Department for Senior Division Units of the Reserve Officers' Training Corps for advanced students. Instruction is offered in Infantry and Field Artillery.

Upon successful completion of the Advanced Course a student may be commissioned as a Reserve Officer of the United States Army, in the appropriate arm or service, upon the recommendation of the Professor of Military Science and Tactics. For details concerning the course, see the Announcement of the Department of Military Science and Tactics.

Course 2 may be elected only by permission of the Director of Resident Instruction in the College and of the Professor of Military Science and Tactics. Credit is counted in the twenty elective hours allowed outside the College of Agriculture (page 19).

Hygiene and Preventive Medicine

All entering students are required to report to the Medical Advisers' Office to make an appointment for a physical examination during the registration days of the first term. Such examination shall be repeated periodically thereafter as indicated by the results of the first or subsequent examination.

Seniors are required to make an appointment for a physical examination during the regular registration days of their last term of residence.

All freshmen are required to include Hygiene 1 and 2 in their schedules.

The following courses may be elected for credit. Prerequisite for these courses, Hygiene 1 and 2. Registration at Hygiene office, Old Armory.

3. **Hygiene: Health Supervision of School Children.** Second term. Credit three hours. Open to sophomores, juniors, and seniors. Prerequisites, suggested but not demanded, Human Physiology and Anatomy. M W F 12. Stimson, Histology Lecture Room. Assistant Professor Gould.

A practical course of lectures and demonstrations designed to familiarize the student with the facts and methods necessary for making an effective health supervision of school children.

4. **Hygiene: Advanced First Aid.** First or second term. Credit one hour. Prerequisite, Human Anatomy or Human Physiology. Enrollment limited and registration only after conference with the professor in charge. F 9. Stimson, Anatomy Lecture Room. Assistant Professor Showacre.

This course includes the theory of the diagnosis and temporary treatment of the common emergencies with practical application of the essential fundamentals.

5. **Hygiene: Industrial Hygiene.** First term. Credit two hours. T Th 12. Stimson, Histology Lecture Room. Assistant Professor Gould.

Factory sanitation, ventilation, and illumination; occupational poisoning and disease; factory legislation; accident prevention; fatigue in industry; preventive medicine in industry.

7. **Hygiene: Rural Hygiene.** Second term. Credit one hour. T 12. Stimson, Histology Lecture Room. Assistant Professor Deyoe.

A general consideration of the health problems peculiar to rural areas with the presentation of practical schemes for the solution of these problems as far as possible.

8. **Hygiene: Mental Hygiene.** First and second terms. Credit two hours. Section 1, M F 11. Boardman A. Assistant Professor Rose. Section 2, W F 2. Section 2, only, repeated in second term. Stimson, Histology Lecture Room. Dr. Stelle.

The relationship of the structure of the total personality to environmental maladjustment as evidenced by physical and social behavior; a discussion of the more common personality difficulties and the rôle of insight in the prevention of these

GENERAL INFORMATION

THE BUILDINGS

The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administrative and classroom building, Roberts Hall, connected by covered loggias with the Dairy Building, now East Roberts, on the east, and with Stone Hall, now occupied by the Department of Rural Education and by the College Library, on the west. Subsequently, the Legislature provided for the erection of two large barns, a greenhouse range, a forestry building, a poultry-husbandry building, a soils building, an auditorium, a classroom building and a stock-judging building for animal husbandry, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an insectary. There are, in addition, a fish-breeding house in Cascadilla Creek, a seed-storage house, a cold-storage and packing house, and other small buildings on the farms. In 1920 the State authorized the College to plan a further development of its building program involving an expenditure of $3,000,000. Under this building plan $500,000 was appropriated in 1920 for a new dairy building, and in 1922 provision was made for its equipment. The building came into use in the fall of 1923. A further appropriation of similar amount was used for completing the Dairy Building, erecting an additional greenhouse range, moving and remodeling the Agricultural Engineering laboratories, and constructing the foundation for the Plant Science Building. The last-named building was completed under an appropriation of $1,100,000 made by the Legislature of 1928, and occupancy began with the second term of 1930–31. The Legislature of 1930 provided $400,000 for the equipment of the Plant Science Building and appropriated $100,000 for additional barns and other smaller buildings for the Department of Animal Husbandry. It also appropriated $100,000 for the construction of the foundation of a building for the Departments of Agricultural Economics and Farm Management and Rural Social Organization, and to this sum the Legislature of 1931 added $500,000 for the completion of the building. The new barns for sheep, swine, and beef cattle were completed in 1931. The Departments of Agricultural Economics and Farm Management and Rural Social Organization occupied their new building in February 1933. In 1934–35 the completion of a new Home Economics building made it possible to move the Department of Entomology into the building previously occupied by the College of Home Economics. The building is now named Comstock Hall.

THE FARMS

The College of Agriculture farm includes 1624 acres. It is run not for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, little more than one-half of the total area is now available for tillage. Of the 1624 acres, 924 are classified as arable, 353 as pasture, and 286 as wood and waste, and 61 are devoted to buildings, lots, and gardens.

Part of the tillable area has been assigned to departments as follows: Agronomy, 22 acres; Animal Husbandry, 342 acres; Floriculture and Ornamental Horticulture, 26 acres; Plant Breeding, 67 acres; Pomology, 99 acres; Poultry Husbandry, 72 acres; Vegetable Crops, 23 acres; and there are left to the Office of Farm Practice and Farm Superintendence 273 acres on which to conduct the regular farm operations. Of the other areas, the Department of Animal Husbandry has the use of all the pasture land; the Department of Forestry administers (now for over two decades) 131 acres of woodland under systematic forest management; it also has the privilege of using an area of approximately 500 acres of typical upland woods and abandoned farm lands in Connecticut Hill section in Tompkins County; and the Department of Entomology uses about 5 acres of waste land for a fish hatchery.

The college farm is composed of a variety of soil types. About two-thirds of the tillable area is Dunkirk clay loam. This soil is entirely unsuited to potatoes, and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The remaining third is Canfield silt loam, Wooster gravelly silt loam, and Volusia gravelly silt loam.

In addition to the lands mentioned, there has been conveyed to Cornell University the Matthias H. Arnot Forest of 1880 acres, for the use of the Department of Forestry. Over the greater part of its area the Arnot Forest is made up of second-growth hardwoods and hemlock. It lies mostly in Schuyler County, near the village of Cayuta and within twenty miles of Ithaca.

Through the generosity of Mr. John P. Young, an area of approximately 540 acres has been given to the University. This consists of several parcels of land, both wooded and open, in the Connecticut Hill region, some fifteen miles west of Ithaca, and well adapted to research work and graduate instruction in forestry and in the plant sciences generally.

A square mile of typical Adirondack timberland in Essex and Hamilton Counties has been deeded to Cornell University by Finch, Pruyn, and Company for forest experiments to be conducted by the Department of Forestry in collaboration with the United States Forest Service. This tract will be known as the Finch-Pruyn Cooperative Experimental Forest.

THE COLLEGE LIBRARIES

The library facilities of the College of Agriculture include: a large collection of books and periodicals on agriculture, animal husbandry, botany, horticulture, forestry, entomology, and other kindred sub-

jects, contained in the University Library and numbering about thirty-five thousand volumes; the Agricultural College Library in Stone Hall, with a working and reference collection of more than ninety thousand bound volumes and a large number of bulletins, reports, and other pamphlets in unbound form; and various small departmental collections for laboratory and office use. Included in these are the Craig horticultural library, gift of the widow of the late Professor John Craig, and the A. I. Root Memorial Library, recently begun but already containing more than fifteen hundred volumes in the field of apiculture. The Department of Animal Husbandry has a large and rapidly increasing collection of herdbooks, registers, and the like, for the use of its instructing staff and its students. Altogether more than one hundred and twenty-five thousand volumes are available for the instructing staff and the students of the College of Agriculture. Wherever they are housed, the books are regularly catalogued at the University Library.

All these libraries are likewise provided with the principal periodicals relating to agriculture and kindred subjects. In the University Library are to be found files and current numbers of the leading foreign periodicals, especially those of a purely scientific character and those used chiefly for research. The Agricultural Library carries on its shelves more than eight hundred periodicals of various kinds for the use of students and faculty; these include the principal agricultural, horticultural, and stock-raising journals of the United States and Canada, together with many from foreign countries. The Entomological Library is supplied with the leading periodicals relating to general and economic entomology. In addition to these, many of the departments receive periodicals for the use of instructors and students; and the Departments of Agricultural Economics and Farm Management, Animal Husbandry, Dairy Industry, Forestry, Plant Breeding, Plant Pathology, and Poultry Husbandry maintain small reading rooms of their own.

Certain of the books of the Agricultural College Library are likely to be in reserve for reference purposes only, and students are then allowed to draw them for home use only when the library is closed over night and over Sunday. In order to afford the greatest possible opportunity for using the books, the Agricultural College Library is open from eight in the morning until ten o'clock at night every day of the week during the college year except Saturday, when it is closed at five o'clock in the afternoon.

SCHOLARSHIPS

The State University Scholarships

Under Chapter 292 of the Laws of 1913, as emended by Chapter 502, Laws of 1920, and Chapter 130, Laws of 1924, the State of New York maintains scholarships, five of which are awarded each county annually for each assembly district therein. Each of these scholar-

ships entitles the holder to $100 for each year while he is in attendance upon an approved college in this State during a period of four years. These are called the State University Scholarships. At Cornell they are commonly known as the *State Cash Scholarships*, to distinguish them from the State Tuition Scholarships in this University. They are awarded by the State Commissioner of Education at Albany, to whom application should be made for any information about the conditions of award, or for any information about the rules of administration.

The University Undergraduate Scholarships

The University Faculty annually awards a limited number of scholarships to members of the incoming Freshman class who attain high standing in a special competitive examination held in Ithaca early in the fourth week of September, beginning on the first day of registration. Some of these scholarships are worth more than others, and they are all awarded according to the relative rank which the successful competitors attain in the examination, the more valuable to the more successful. A competitor may win one scholarship of one of these three groups:

(a) Five George W. Lefevre Scholarships, each having an annual value of $400 and being tenable each year so long as the holder remains in good standing in the University as undergraduate or graduate student; only those candidates are eligible for Lefevre Scholarships who furnish proof of their financial need.

(b) Two Eudorus C. Kenney Scholarships (if they are to be awarded by the Faculty Committee on Scholarships), each continuing for four years and having an annual value of $250.

(c) Eighteen University Undergraduate Scholarships, each continuing for two years and having an annual value of $200.

See the *General Information Number* for the rules of award.

The Roberts Scholarships

The Roberts Scholarship Fund, a gift of the late Dr. Charles H. Roberts, of Oakes, Ulster County, New York, provides ten scholarships, each retainable for one year, but not open to newly entering students. As expressed by the founder, the purpose of these scholarships is to furnish financial assistance to students in the College of Agriculture who are of good moral character, who show native ability, tact, and application, and who are in need of such assistance, especially students coming from rural districts. The awards is made after the close of each year. Application blanks and copies of the regulations may be obtained at the office of the Secretary of the College of Agriculture. All applications must be on the official blanks, which, with all other information, must be filed with the Secretary of the College by June 1. The value of each scholarship is $114.

Dreyfus Memorial Scholarships

Two scholarships of an annual value of $500 each have been established by Mrs. Berta E. Dreyfus in memory of her husband, Dr. Louis A. Dreyfus. In their award preference is given first to students coming from the high schools of Richmond County, New York, and next to those from Sandusky County, Ohio. First consideration is given to those specializing in Chemistry, Engineering, or Agriculture or, in the case of women, in Home Economics or Arts and Sciences. Application must be made to the Secretary of the University before the first Wednesday of May.

Hervey S. Hall Scholarship

The Hervey S. Hall Scholarship, established by bequest of Miss Mary F. Hall, of Spencer, New York, and having an annual value of $120, is to be awarded to a properly qualified student of either sex, a resident of New York, pursuing a course in Agriculture or Forestry leading to the degree of bachelor of science, and in need of financial aid. It is "to be granted first to a student from the town of Spencer, New York, should a suitable candidate appear, or else to a student from Tioga County, or from the State at large." Application for this scholarship should be made to the Secretary of the College by June 1.

The New York Florists Club Scholarships

The New York Florists Club offers for 1938–39 three scholarships, each having a value of $200, divisible at the discretion of the faculty. These awards are to be made to students of the junior or the senior class who are specializing in the field of Floriculture and Ornamental Horticulture. Applications for these scholarships should be made to the Secretary of the College by June 1.

Other Scholarships

A description of other scholarships open under certain conditions to undergraduates in the College of Agriculture will be found in the *General Information Number*.

PRIZES

The Eastman Prizes for Public Speaking

With the object of developing qualities of personal leadership in rural affairs, Mr. A. R. Eastman, of Waterville, New York, established annual prizes, the first of $100 and the second of $20, for public speaking on country-life subjects. These prizes are designated the Eastman Prizes for Public Speaking. Competition is open to any regular or special student in the College of Agriculture. The contest takes place in February.

The Rice Debate Stage

To stimulate the study and public discussion of vital farm-life problems, Professor James E. Rice, Professor of Poultry Husbandry, emeritus, has established annual prizes, the first of $100 and the second of $25. The contest of 1938–39 is in the form of a debate. Preliminary trials are held in December on a subject to be announced. The final competition is held in Farm and Home Week. All regular or special students are eligible.

The Ring Memorial Prizes

By bequest of Mr. Charles A. Ring, of Niagara County, New York, a first prize of approximately $25 and a second prize of approximately $15 have been established, to be awarded to undergraduate students in Agriculture who, in essays giving reviews of the literature on problems in floriculture, vegetable gardening, or pomology, show the greatest ability to evaluate scientific evidence. The contest is open to students who have taken or are taking courses in the horticultural departments and who are scholastically in the upper fourth of the senior class in Agriculture. A list of those eligible is announced each year. The essays must be submitted to the Secretary of the Faculty of Agriculture by noon on May 1.

The Charles Lathrop Pack Foundation Forestry Prize

The Charles Lathrop Pack Foundation Forestry Prize is in the amount of $40, and is awarded annually in April for the best essay on forestry submitted by a resident student who has taken some course in forestry during the current college year. The purpose of the prize is to aid in training men and women to write articles which will arouse in the public an interest in forestry and an appreciation of what forestry means to the country. The award is made by a committee appointed by the President of the University. The detailed regulations are furnished by the Department of Forestry or by the Secretary of the College. The essay must be deposited at the office of the head of the Department of Forestry by noon of April 15.

Alumni Prize

The Alumni Association of the College of Agriculture contributes an annual prize of $25 to be awarded at the close of the junior year to the student who has maintained the best scholastic record during his three years in the University, the award to be made by the Faculty of the College.

Alpha Zeta Cup

The Alpha Zeta fraternity has presented a prize cup to be awarded for custody for one year to the male student in the College of Agriculture making the best scholastic record during the freshman year. For

students first admitted in the second term, the average of three terms' work is considered. Presentation of the cup is made at the opening of the fall term.

Other Prizes

For information concerning other prizes offered in the University and open to competition of students in the College of Agriculture, see the special pamphlet on prizes, which may be obtained upon application to the Secretary of the University.

Loans

The New York State Grange has established a loan fund to aid its members in obtaining a higher education. Applications may be made to Mr. H. M. Stanley, Skaneateles, New York.

A fund contributed by students of the College is available for small, short-time, emergency loans. Application may be made to the College Secretary.

A fund, the interest on which is available for loans to students specializing in Floriculture, has been established by Mr. Max Schling of New York City.

Another loan fund for students of Floriculture, with principal and interest available, has been contributed by the New York Florists Club. Applications for loans from this and the preceding fund may be made to the College Secretary.

Notice of other loan funds, available to students of all colleges in the University, is found in the *General Information Number*.

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